



UGANDA PROTECTORATE

ANNUAL REPORT

OF THE

Medical Department

FOR THE

Year ended 31st December, 1949

PRICE: TWO SHILLINGS

Published by Command of His Excellency the Governor

ENTEBBE

PRINTED BY THE GOVERNMENT PRINTER, UGANDA

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MEDICAL DEPARTMENT

ANNUAL REPORT

For the year ended 31st December, 1949

SECTION I.—ADMINISTRATION

A. Staff

Dr. T. A. Austin, who had been Director since 1946, proceeded on leave pending retirement and Dr. R. S. F. Hennessey assumed office as Director in May.

2. The shortage of professional staff continued. Vacancies in the establishment of forty-one medical officers rose from nine to fifteen during the year, while there were only ten health inspectors to fill twenty posts. The recruitment of nursing sisters improved and it was possible to fill most of the remaining vacancies by temporary local engagement.

3. There were numerous changes in the provincial medical staff. In Buganda, Dr. J. J. Black assumed duty as Provincial Medical Officer in July following the transfer of Dr. C. R. C. Rainsford to Zanzibar. In the Eastern Province, Dr. E. J. Blackaby retired and Dr. I. W. Mackichan was appointed Provincial Medical Officer in October. After the retirement of Dr. J. J. Mitchell, Dr. B. A. Coghlan, Provincial Medical Officer, Western Province, took charge of the Northern Province until he himself retired in May. He was succeeded by Dr. W. A. Wilson, and Dr. D. G. Snell assumed charge of the Northern Province in September. Owing to the shortage of European Health Inspectors, frequent changes were necessary to enable one inspector to be posted to each Provincial Headquarters.

B. Outstanding Events of the Year

4. The steady expansion in the activities of the Medical Department was checked by the second world war. This setback was overcome to some extent during the immediate post-war years and expansion is now proceeding at a rate determined by availability of funds and trained staff. New therapeutic measures have increased the popularity of the curative services, and the demand for extension of these services is far greater than can be met from the territory's resources.

5. Despite advances in treatment, the incidence of malaria, yaws, leprosy, intestinal diseases and venereal diseases has not yet been reduced. Indeed, the incidence of some of these infections, notably venereal diseases, may be increasing. The popular demand for more curative services takes little or no account of their heavy recurrent expenses, while the restricted applicability of drug prophylaxis and treatment is seldom appreciated.

6. Improvement in the health of the people must continue to depend on preventive rather than curative measures. Improvement will also result from the co-ordinated activities of all agencies concerned with social betterment, of which housing, feeding and habits of living are particularly important. The increase in productive capacity arising from better health should eventually provide the necessary funds for extending the personal medical services; meanwhile as much as possible of the available money is being devoted to an attack on the faulty environments and habits which are the chief causes of disability.

7. *Riots in Buganda*.—As a result of the civil disturbances in Buganda during April, twenty-three patients were admitted to Mulago Hospital with serious injuries and many more were treated for minor injuries. Subordinate staff behaved well during those difficult times. In spite of intimidation, attendances for duty were practically normal.

8. *Social Development*.—The close relationship which has developed between the Medical Department, the Labour Department and the Public Relations and Social Welfare Department is proving of special value in the treatment of faulty conditions and habits. The growth of co-operative enterprises and the increasing participation of African Local Governments in the day-to-day management of rural medical and public health activities have been noteworthy.

9. *Economic Development and Public Health*.—The construction of the dam across the river Nile at Jinja and the industrialisation to be expected from hydro-electric power production will have many repercussions of medical importance. The large increase of population in this area, both African and non-African, has already presented difficult housing problems; while the constructional works have given rise to anxieties on the score of malaria and sleeping sickness and have imposed a severe strain on the reduced staff at Jinja. Interesting problems have called for solution, including the control of the fly *Simulium damnosum*. Apart from its unpleasant bite, this insect is the carrier of a small worm (*Onchocerca volvulus*) which may cause damage in the skin and eye and which has retarded the utilisation of large stretches of countryside bordering the Nile. Biological studies of *Simulium* were begun, with a view to the development of an effective scheme of control.

10. The plan for the manufacture of cement from the limestone deposits near Tororo is of special interest. Cheap cement, readily available, should do much to popularise the use of permanent materials for building construction. This scheme will help to provide good housing at an economic price.

11. It is expected that the domestic consumption of fish will be increased by the activities of the Uganda Fish Marketing Corporation (TUFMAC). Protein shortage is an important nutritional problem for large sections of the indigenous population, and the improvement of fish supplies can do much to help in this direction.

C. Distinguished Visitors

12. Two visits were paid to Uganda by Lieutenant-General F. Daubenton, representative in Ethiopia of the World Health Organisation. Visitors from the United Kingdom and elsewhere included the following:—

NUFFIELD PANEL OF VISITORS

Professor R. C. Browne, from the Department of Industrial Medicine, Durham University.

Dr. E. R. Cullinan, from St. Bartholomew's Hospital, London.

Sir Stewart Duke-Elder, Director of Research, Institute of Ophthalmology, University of London.

COLONIAL OFFICE

Dr. E. D. Pridie, Chief Medical Officer, Colonial Office.

Dr. R. Lewthwaite, Director of the Colonial Medical Research Service.

OTHERS

Professor G. W. Pickering, from St. Mary's Hospital, London.

Dr. T. M. Ling, Medical Director of Roffey Park Rehabilitation Centre (under the auspices of the Rockefeller Foundation).

Sir Henry Tidy, who visited Mulago Hospital on behalf of the General Medical Council.

Professor J. Schwetz of the Free University of Brussels, who investigated schistosomiasis in several parts of western Uganda.

Mr. H. K. Stage of the United States Department of Agriculture.

SECTION II.—VITAL STATISTICS

A. African Population

13. Uganda alone of the East African territories has attempted compilation of returns of births and deaths for the whole African population. Doubts have been expressed in the past about the accuracy and significance of these statistics. A report on the returns was received during the year from the Director of Statistics, East Africa High Commission, who confirmed that they contained certain errors and showed that the compilation of data had not been all that could be desired.

14. Births and deaths are entered in registers kept by Gombolola Chiefs, information being transferred to the registers from records kept by subordinate chiefs. It has been ascertained that notifications may be accumulated over several months before being transferred to the registers and the risks of omission are accordingly great. By checking notified deaths of infants against entries in the birth registers it has been found that the percentage of births not registered may in some cases be as high as 60%. On the other hand, some gombolola registers seem remarkably accurate. The census taken in 1948 afforded an opportunity of estimating the errors due to faulty registration of births. About 20% to 30% of births do not appear to have been registered, the error varying considerably from district to district. Omission of deaths is less frequent.

15. From the registers, monthly totals are prepared of births, still-births, and deaths, classifying the deaths as infant deaths, maternal deaths or others. The still-births rates have always been suspect; in the 1920's they were very high, giving rise to a belief in the widespread incidence of syphilis; while in recent years they have been incredibly low. Inspection of the original returns has shown that many chiefs never return a still-birth, and it is apparent that the majority have not understood the term. This failing is not confined to the chiefs, for the returns by midwives from Maternity Centres reveal a good deal of confusion between still-births and deaths of infants born alive.

16. Clerical lapses and administrative failures have accounted for many errors in the past, e.g. the omission of returns or counting the same return twice. The birth and death rates published in past Annual Reports are now known to have been based upon populations which were not estimated accurately, as was shown by the 1948 Census results; while it has been found that transfers of population from one district to another have not been taken into account.

TABLE I
African Population—Uganda (excluding Karamoja)

Population (millions)	Year	BIRTHS		DEATHS	
		Numbers (annual)	Rate per 1000	Numbers (annual)	Rate per 1000
3.53	1930/34	97,500	27.6	70,800	20.1
3.75	1935/39	99,900	26.6	66,900	17.8
4.14	1940/44	108,700	26.3	77,200	18.7
4.41	1945	118,100	26.8	78,800	17.7
4.55	1946	116,400	25.6	79,800	17.6
4.70	1947	120,300	25.6	70,400	15.0
4.83	1948	123,800	25.6	67,800	14.0
4.98	1949	122,000	24.5	61,000	12.3

17. The accuracy of the returns of infant mortality is undermined by the difficulty of determining when a child has attained the age of one year. In the census returns there are many more children under one year of age than could have survived from all the children born in the previous twelve months; infant deaths are consequently likely to be over-estimated, and the true rates will be correspondingly lower. Surprise is sometimes expressed that the infant mortality could be so low in an undeveloped country devoid of the elaborate medical organisation found in European countries; but bearing in mind the favourable effect of a warm and humid climate on the survival of premature infants, and the relative infrequency of such diseases as bronchitis, measles and whooping cough as causes of death among African infants, the recorded rate may be accepted as a rough approximation.

TABLE 2

Infant and Maternal Mortality Rates—African Population

Year			Infant Mortality per 1000 live births	Maternal Mortality per 1000 live and still births
1926-29	...	...	253	...
1930-34	...	...	191	13·5
1935-39	...	...	152	10·6
1940-44	...	...	126	7·1
1945	...	...	110	5·7
1946	...	...	120	6·0
1947	...	...	99	5·3
1948	...	...	95	4·7
1949	...	...	69 77	not yet available

For comparison, the infant mortality rate in England and Wales was 154 in 1900, 66 in 1931 and 34 in 1948.

B. Europeans

GENERAL

18. European patients at Government Hospitals during 1949 totalled 7,423, of whom 4,345 attended the European Hospital, Kampala.

TABLE 3

European Patients

	Year	OFFICIALS		NON-OFFICIALS		Total
		Males	Females	Males	Females	
New cases ...	1948	1,529	862	1,060	1,380	4,831*
	1949	2,510	1,787	1,417	1,699	7,413
Hospital admissions ...	1948	308	296	352	365	1,312
	1949	340	357	344	257	1,298
Deaths in hospital ...	1948	2	0	6	2	10
	1949	3	1	9	4	17

NOTE.—* The returns for 1948 do not include injections, vaccinations, inoculations and minor dressings undertaken at the European Hospital, Kampala.

19. The deaths of thirty-eight Europeans were registered, of which nine were the result of accident. Only one death was recorded as due to malaria. Cancer and diseases of the arteries affecting the heart and the brain, which are among the commonest causes of death in Great Britain, are also prominent as causes of death among Europeans in Uganda. The contrast with the low incidence of death from these causes in Asians may be explained in part by the greater average age of the European population.

20. OFFICIALS

TABLE 4
European Officials

	1939	1947	1948	1949
Total number of officials	667	736	737	873
Mid-year numbers on Staff List ... ..	...	...	753	810
Average number resident	563	672	633	707
Number of deaths	0	3	2	2
Number invalided	1	3	0	2
Number of illnesses during the year	1,319	485	388	391
Number of days on sick list	3,782	2,362	2,688	3,155
Number granted sick leave	43	30	64	79
RATES—				
Percentage of daily sick to average numbers resident	1.8	0.96	1.16	1.22
Average days sick each illness	2.97	4.87	6.93	8.07
Average days sick leave per patient	16.4	12.4	13.8	16.5

21. The increasing average duration of each illness is noteworthy; a sample of the sickness returns for the past three years has been analysed in an attempt to explain this increase. The change appears to be confined to patients treated at the European Hospital, Kampala.

TABLE 5
Illness in European Officials

Year	Average duration of illness in days	
	European Hospital Kampala	Elsewhere in Protectorate
1947	6.8	4.9
1948	7.0	3.3
1949	10.1	5.0

22. The principal affections necessitating lengthy treatment in hospital are set out in Table 6.

TABLE 6
European Officials—European Hospital, Kampala

	Number of Patients	Average duration of treatment (days)
Amoebiasis	32	12.5
Fistula and other rectal conditions	3	36
Carcinoma	2	39
Appendicectomy	6	18
Gastric and duodenal ulcer	3	19
Hepatitis	2	25
Hyperpiesia	2	25
Psychological disorders	8	14

23. At district hospitals, the diseases treated are mainly acute infections of short duration. Malaria is the most frequent of these, accounting for thirty per cent of all patients in the Eastern Province, thirty-two per cent in the Western Province, forty-three per cent in the Northern Province, but only seventeen per cent of all patients in Kampala. The length of time on the sick list for malaria (6·3 days) is the same in Kampala as in the other Provinces. The increasing average time in hospital may be because many patients with major affections are now investigated and treated in Kampala, instead of being sent to the United Kingdom.

24. The morbidity among European officials, as expressed by the daily sick rate, rose from its pre-war level to a peak of 2·3 per cent between 1942 and 1944, but fell again to a low level with the influx of new recruits and the resumption of normal leave arrangements after the war.

C. Asians

GENERAL

25. Asian patients treated at Government hospitals during 1949 totalled 11,840 compared with 12,016 in 1948. A smaller proportion of the total is treated in Kampala compared with Europeans, only 2,997 being seen at the Central Asian Hospital.

TABLE 7

Asians

	Year	OFFICIALS		NON-OFFICIALS		Total
		Males	Females	Males	Females	
Patients treated...	1948	3,295	592	3,997	4,132	12,016
	1949	3,423	601	3,772	4,044	11,840
Hospital admissions	1948	198	140	948	1,177	2,463
	1949	169	139	852	1,100	2,260
Deaths	1948	1	...	14	12	27
	1949	3	2	27	12	44

26. The deaths of 186 Asians were registered in 1949. Twenty-three were the result of accident, thirteen being burns. In striking contrast to the Europeans, malaria accounted for thirty-four deaths (including six from blackwater fever), while pneumonia accounted for twenty-two. This may be due in part to the preponderance of children in the Asian population compared with the European population.

27. OFFICIALS

TABLE 8
Asian Officials

	1939	1947	1948	1949
Total number of officials in estimates ...	419	483	458	589
Average number resident ...	379	467	414	552
Number of deaths ...	0	2	2	1
Number invalided ...	2	3	2	3
Number of illnesses during year ...	724	507	479	500
Number of days on sick list ...	1,821	2,354	2,250	2,273
Number granted sick leave ...	10	4	9	13
RATES—				
Percentage of daily sick to average number resident ...	1.46	1.37	1.48	1.13
Average days on sick list per illness ...	2.52	4.64	4.69	4.55
Average days sick leave per patient ...	16.8	19.3	18.1	21.5

The above figures do not include officials of the East African Railways and Harbours, Posts and Telegraphs Department and Public Works Department artisans on temporary agreement.

D. African Officials

TABLE 9
African Officials

	1939	1947	1948	1949
Total number of officials in estimates ...	222	1,499	1,672	1,626
Deaths recorded ...	...	...	1	...
Number invalided ...	...	...	2	1
Number of illnesses during year ...	89	150	216	125
Number of days on sick list ...	227	657	993	690
Number granted sick leave ...	1	1	2	...
RATES—				
Percentage of daily sick to number in estimates ...	0.28	0.12	0.16	0.12
Average days on sick list per illness ...	2.55	4.38	4.59	5.52
Average days sick leave per patient ...	21	14	10.5	...

28. There is reason to believe that the notifications of sickness and death are defective.

SECTION III.—PUBLIC HEALTH

A. General Remarks

29. Information about the state of public health is drawn from the following sources:—

30. (a) *Returns of deaths by Chiefs.*—The total deaths notified are reasonably accurate, but the allocation of deaths to the primary cause leaves much to be desired. While the infectious diseases are generally diagnosed accurately, many deaths from “old age”, “chest”

or “njoka” (literally, a snake in the stomach) afford little information about the real cause of death. Less than one-twentieth of all deaths occurred in Government hospitals and it is rare for deaths outside to be attended by medical practitioners.

31. (b) *Notification of infectious diseases*.—These include patients treated at Government medical units and also cases notified by private practitioners, health inspectors and chiefs or discovered during routine surveys. The completeness and promptitude of the notifications depend on many personal and administrative factors. It is difficult at the time to judge how complete the notifications are, but subsequent information often demonstrates their inaccuracy.

32. (c) *Hospital and dispensary returns*.—In European countries, little use has been made of hospital returns as a guide to the incidence of disease since the data available in the past have been fragmentary. In Uganda, where each unit is accustomed to make a classified return for all patients and where the large bulk of treatment is undertaken by Government, useful information can be extracted from such returns. The accuracy of diagnosis is subject to the greatest error in the returns from dispensaries in charge of unqualified medical staff. The accuracy improves for hospital patients and is highest for deaths corroborated by post-mortem examination. These latter groups are, in turn, both smaller in number and more subject to selection, so that their usefulness for estimating the incidence of particular diseases is limited.

33. (d) *Morbidity data from selected communities*.—Information about the incidence of disease can be obtained from the sickness records of Government officials, prisoners, school children and labourers in industrial and agricultural enterprises. Other sources of information are ante-natal clinics and special surveys covering scattered areas of the country. None of these can be considered satisfactory random samples, and conclusions drawn from them have to be used with caution when the whole population is being considered.

34. The diseases which bulk most largely in the hospital returns and those most commonly leading to admission are set out in Tables 10 and 11, respectively.

TABLE 10
Hospital patients

Disease	Patients Treated	Percentage of all patients seen
Malaria including blackwater fever	107,949	13·0
Respiratory diseases (all forms)	92,423	11·1
Venereal diseases	88,689	10·7
Accidents	70,293	8·5
Diseases of the eye	30,284	3·7
Dysentery and diarrhoea ...	21,158	2·6

TABLE II

Hospital admissions

Disease	Admissions to wards	Percentage of all admissions
Venereal diseases	10,686	12.0
Malaria including blackwater fever	9,840	11.0
Pregnancy and childbirth ...	7,891	8.9
Respiratory diseases	8,560	9.7
Accidents	7,363	8.2
Helminthic infections	4,678	5.3

35. The infectious diseases have in the past been regarded as of foremost importance in tropical territories, but other conditions are now recognised as having a profound effect upon health standards. Nutritional deficiencies are probably a common cause of impaired efficiency, while anaemia deserves considerable attention. During the past year, a field investigation was commenced in Mbale District near Budaka, in a region where a high incidence of anaemia in school children had been noted. From preliminary reports it seems that several factors may be involved. The geographical distribution corresponds with that of seasonal shortages of food, there is a high rate of hookworm infection and iron deficiency is also suspected. "Kwashiorkor" or "malignant malnutrition" of sucklings also occurs frequently, but its incidence is not entirely parallel with the anaemia under investigation. A wider survey of social and economic factors is planned, including comprehensive information as to the production, storage and export of food-stuffs in the affected areas.

36. The importance of these conditions which may give rise to no gross disability, lies in their long duration. An attack of pneumonia is quickly followed by complete restoration to health and produces only a transient disability; a helminthic infection or undermining disease like anaemia causes prolonged disability and may lower the productive capacity of the patient for years. Accepting his ill-health as inevitable the sufferer may make no effort to seek treatment. It is not sufficient to wait for the patient to come to hospital; active steps are required to detect these conditions in the field and to deal with them there.

B. Nutrition and food supplies

37. *Small-Scale Dietary Surveys.*—During 1949 a report was studied of an investigation by an officer of the Agricultural Department which had been in progress over a whole year covering three families in Bunyoro whose food intake had been weighed each day. The diet was most deficient during the early rains, particularly in fats and possibly in vitamin A. When the new crops became available, the diet improved, the carbohydrate fraction decreasing as the fat and protein elements increased.

38. *Signs of deficiency disease.*—Surveys of school children and prisoners have been made, both as routine administrative precautions and in connection with special investigations. A detailed examination of Indian and African school children in Kampala revealed a high incidence of cheilosis, angular stomatitis, crackle-skin, and various tongue changes. Over fifty per cent of the Indian children showed signs of cheilosis, although their diet was rich in pulses and milk. A small group of these children was treated with riboflavin and nicotinic acid. Compared with a control group, the cheilosis was not affected by the treatment but responded well to the administration of iron.

39. Another group of Indian children who had a blood haemoglobin of less than 13 grams per 100 mls. also improved following iron therapy.

40. Sporadic cases of night blindness have been recorded during the year among prisoners, school-children and the general population, associated with the shortage of sweet potatoes which occurs at certain times of the year. The “kwashiorkor” syndrome in infants has continued to receive attention at Mulago Hospital.

41. It is thought that faulty nutrition may have an important bearing on the progress of other diseases, apart from obvious signs of deficiency. The role of nutrition in building up resistance in tuberculosis is well known. In leprosy it has been observed that infected school children weighed less than normal children of the same age, and a long-term observation is planned to determine whether the spontaneous regression of the infection is dependent on the state of nutrition.

42. *Food yeast.*—Supplies of food yeast were received from the United Kingdom during 1948, and towards the end of that year experiments were started in Kampala to ascertain its value under local conditions. At Kibuli Primary School fifty children were given a roll of bread with $\frac{1}{4}$ -oz. yeast daily for a period of three months, a control group being used for comparison of the results.

43. It was found that more children on food yeast showed an increase in height during the experiment than was the case among the control children; and to a lesser extent, which was not statistically significant, an increase in weight and improvement of their anaemia. The supplement had no effect upon the lesions commonly attributed to vitamin B deficiencies, which were present among children in both groups.

44. A similar experiment was carried out over a period of seven months in the Central Prison, Luzira, but with indecisive results. The addition of the food yeast appeared to make the diet more attractive and stimulated the appetite. During the course of the experiment, which terminated at the beginning of the long rains, many of the clinical signs regarded as indicators of deficiency became more prevalent; the only clinical conditions which seemed to improve following the addition of food-yeast were oedema of the tongue and folliculosis.

45. During February a short course of instruction in nutrition was given at Makerere College by experts from the United Kingdom under the guidance of Professor B. S. Platt, Consultant on Nutrition to the Colonial Office. The course was attended by workers drawn from various departments in East African territories whose work had a bearing on nutritional problems.

46. A member of the Directorate of the Medical Department represented Uganda at an inter-territorial conference on nutrition held at Dchang in the French Cameroons in October.

C. Communicable diseases

(I) ARTHROPOD-BORNE

47. *Malaria*.—Malaria still maintains its importance as one of the major causes of morbidity and mortality in hospital admissions, although in recent years there has been a large decline in reported deaths from the disease among Europeans and (to a lesser extent) Asians. The available evidence suggests that no appreciable change has taken place in its incidence among the general African population.

TABLE 12
*Deaths of Europeans due to Malaria **

	1930- 1939	1946	1947	1948	1949
Deaths from Malaria ...	32	1	0	3	1
Total deaths from all causes ...	162	36	31	39	38
Percentage of deaths due to malaria	19.7%	3.5%			

* Includes blackwater fever.

N.B.—In interpreting the above table, two landmarks should be borne in mind:

- (i) the introduction of mepacrine (atebrin) in 1932 and the gradual ousting of quinine by mepacrine for the treatment of blackwater fever;
- (ii) the scarcity of quinine during the war years and its replacement by mepacrine and paludrine for prophylaxis against malaria.

TABLE 13
Deaths due to Malaria—All non-natives

	1936- 1940	1946	1947	1948	1949
Deaths from malaria ...	342	77	43	43	35
Total deaths from all causes ...	737*	251	231	235	224
Percentage of deaths due to malaria	28%	31%	19%	18%	16%

* 3 years only.

48. It is now an unusual event to become infected with malaria in some of the major towns. Entebbe reported six breeding places of anopheline vectors during the whole year, and only four Europeans were known to be infected within the township. In Kampala Municipality, 259 breeding places were reported, but only 13 adult anophelines were caught in dwellings during the year. Of 103 patients treated for malaria in the Government European and Asian Hospitals, only 10

were thought to have contracted the infection within the municipal boundaries. Ten miles of new earth drains were dug in Kampala, while a mile and a half of open concrete drains and nearly three miles of sub-soil drains were constructed. Numerous brick-pits were cleaned and stocked with *Lebistes* fish. The chief remaining dangerous areas include the Kabaka's Lake and adjacent swamp and pits used in the manufacture of bricks.

49. Jinja, the centre of so much industrial development, is not so fortunate. The extension of housing schemes has brought residential areas into closer proximity with the peripheral breeding grounds such as brickfields and the lake shore swamps. One unusual hazard is the breeding of larvae in hippopotamus footprints. Engineering schemes are notorious for creating malaria hazards and the constructional works now in progress have produced many new mosquito breeding places—waterlogged ground, uneven drainage channels, leaking water tanks—while many Europeans, new to the tropics, are not yet malaria-conscious. Control measures have presented their peculiar difficulties, and during the year one entomological orderly lost his life on the steep banks along the River Nile. Attempts at control by spraying gammexane powder on backwaters below the Falls were ineffectual owing to irregular changes of wind. Along the lake shore, the reclaimed swamp is being protected by stone facings and a punt is employed for spraying oil along the Lake edges. In spite of the large increase in the susceptible population, many of whom neglect to use mosquito nets, only 19 patients were treated for malaria at the Government Hospital during 1949. This is attributed to the prophylactic use of proguanil (paludrine). Although valuable as a prophylactic, the drug is of limited value for treatment.

50. In other townships, various combinations of earth and concrete drainage systems are employed. The Inter-territorial Malariologist was able to inspect many of these during the year and to advise on control measures. Catching stations for adult mosquitoes have been established in some townships and should in time become a valuable aid in the control of malaria.

51. *Malaria in the African Population.*—Our information about the incidence of malaria among the general African population is less precise. Eighty per cent of the diagnoses of malaria at hospitals are unsupported by microscopic examination, the proportion varying in different units. It appears from the returns that malaria incidence is fairly uniform throughout the Protectorate, with the exception of the higher altitudes. The highest proportion of patients suffering from malaria is reported from the Northern Province, where the disease accounted for 18% of all patients treated and 20% of all deaths in hospital. The proportion of cases confirmed microscopically is also highest in the Northern Province. In Kabale only 4% of all patients treated were so diagnosed while 3% of deaths among hospital patients were due to malaria. But this experience in the district hospital, situated at over 6,000 feet above sea level, does not necessarily hold true for other parts of the district.

52. The total number of patients treated for malaria in Uganda has fluctuated around 100,000 for the past four years and has shown no marked upward or downward trend. The seasonal fluctuation in number is slight and bears no clear relationship to the rainfall. The case fatality rate based on patients admitted to hospital, is 2.3%, being higher (3.3%) for cases confirmed microscopically than for the unclassified group (1.4%). The distribution by provinces of all forms of malaria recorded at hospitals is shown in Table 14.

TABLE 14

Year	Buganda		Eastern Province		Western Province		Northern Province	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
1948	26,071	92	43,590	145	14,125	34	18,103	49
1949	30,246	68	46,572	98	11,760	25	19,311	53

53. The control of malaria among the African population in rural areas presents a problem for which a practical solution has yet to be found. Anti-malarial drainage of the type used in townships cannot be advocated, not only on the grounds of expense but because its success would depend on the rigid control of African cultivation and restrictions on the herding of cattle in swampy areas. Personal measures of prophylaxis by mosquito-proofing houses, insecticidal spraying, the use of mosquito nets and chemoprophylactic drugs are at present beyond the reach of the mass of the population.

54. The practicability and desirability of vector elimination by residual spraying and anti-larval operations have still to be assessed for a hyperendemic rural terrain such as exists over most of Uganda; apart from the financial aspect, disturbance of the existing host-parasite relationship would carry serious risks if eradication was not complete and permanent.

55. During 1949, reports were received of an unusual amount of malaria in Kigezi district. The pressure resulting from rapid growth of the local population, which has reached a density of 240 persons per square mile in two counties, is being relieved by resettlement of some of the inhabitants in sparsely inhabited land below 4,000 feet. The non-immune settlers experienced epidemics of malaria in their new homes; one survey at Kambuga showed that 30% of the children under 14 years of age had parasites in the blood, although the spleen rate was only 2%. Surveys showed that the number of mosquitoes in houses falls off rapidly between 4,200 and 4,500 feet. Both *A. gambiae* and *A. funestus* were found breeding. The measures needed to combat this danger are to site houses on the tops of ridges away from water, to encourage the clearing of long grass and the cultivation of low crops around the houses, to avoid cultivation at the edges of swamps, and to eliminate breeding at water-holes and stream crossings. Latest reports indicate that the more intense manifestations of malaria are declining in frequency.

56. A similar occurrence has been noted on Mount Elgon, where some of the Bagishu now suffer severely from malaria in childhood and develop splenomegaly after puberty.

57. Agricultural operations, especially the uncontrolled cultivation of sweet potatoes in swampy land, are liable to lead to troublesome breeding of larvae. In the Eastern Province, the growing of rice in the swamps fringing Lake Kioga may be a prolific source of *A. gambiae*. Swamp irrigation in Kigezi has at times encouraged the breeding of *A. christyi*, which is suspected of being a vector of malaria.

58. The extension of urban conditions beyond the boundaries of townships and around small trading centres is creating further dangers. The borrow-pits dug in the making of roads and houses, pits for brick-making, water stagnating at culverts and in wheeltracks, with the crowding together of the inhabitants, all favour the spread of infection. While an effective immunity can be developed in undisturbed rural conditions, there is a clear need for minimising the factors which may lead to a breakdown of immunity in the neighbourhood of growing towns. Efforts are being made to control these unfavourable conditions where they occur.

59. *Blackwater Fever*.—Thirty-nine patients of all races were treated in hospital for blackwater fever, nine dying. From incomplete information regarding those treated elsewhere, it is known that at least three Europeans and 25 Asians contracted the disease and that six Asians died from the disease during the year. Blackwater fever has been noted among Africans in the Acholi District, where such an occurrence was formerly unknown. In hyperendemic areas, it appears to occur chiefly among Africans who practise drug suppression of malaria.

60. *Trypanosomiasis*.—During 1949, 104 cases of sleeping sickness were discovered, compared with 54 in the previous year. Whereas in 1948 it could be claimed that every district in the Protectorate showed a reduction in the number of cases, every infected district with two exceptions showed an increase in 1949. The moral is plain: constant vigilance is the only safeguard against this disease.

TABLE 15
Cases of Trypanosomiasis reported

	1945	1946	1947	1948	1949
Buganda—					
Mengo	1	15	6	2	5
Eastern Province—					
Busoga	45	29	14	7	35
Mbale	20	17*	11	5	23
Western Province—					
Toro ... ..	...	31	33	18	4
Bunyoro ... ..	...	...	...	1	10
Northern Province—					
West Nile	107	103	24	9	12
Acholi	103	7	15	5	13
Other districts	41	12	4	7	2
TOTAL CASES	317	214	107	54	104
TOTAL DEATHS	12	10	3	2	6

* Includes thirteen cases erroneously attributed to Teso in previous reports.

61. Toro District was the only area to show a major decrease in the number of cases reported, i.e. from eighteen in 1948 to four in 1949. More extensive clearings have been made along the River Nyamugasani at the southern end of Ruwenzori, and the boundary of the Sleeping Sickness area was redefined and taken up to the 5,000 feet contour. Over the past ten years, the main focus of infection in this area has shifted eastward from the Congo border; there are fears that infection may be carried to Lake George, which has recently been opened up to fishing under the control of the Uganda Fish Marketing Corporation. Poaching was known to occur on the Lake, and organized settlements have now been allowed on the Ankole shore.

62. A new outbreak occurred in the Buruli counties of Bunyoro and Mengo districts. There was some uncertainty at first about the nature of the infecting organism, but it was eventually considered to be *T. rhodesiense*. The disease was relatively mild but resistant to treatment; the vector was *G. pallidipes*.

63. The number of cases reported from South Busoga and the adjoining part of Mbale District rose from twelve to fifty-eight. The infections were due to *T. rhodiesiense*, and were mostly acquired in known *pallidipes* infested areas. Two small groups of cases, one at Bugungu (on the west side of Napoleon Gulf) and the other lower down the Nile Valley, could not be assigned with certainty to contact with *G. pallidipes*, and suspicion arose that the infection might have been carried either by *G. palpalis* or *G. brevipalpis*. Some immigrant labourers from Ruanda were found to have been infected before their arrival in Busoga. Of the cases found in Mbale District, two came from Kenya and were infected with *T. gambiense*. Several came from Busoga District, and the others were believed to have been infected while hunting across the Busoga border. Buvuma Island produced a few cases, all attributable to local infection by *G. pallidipes*.

64. In the Northern Province, the infecting organism is *T. gambiense*, and the disease still occurs in the West Nile and Acholi Districts. A new focus was discovered in Acholi, apparently infected by fly concentrating at a small pool in a dry river bed during the dry season. A new motor road was opened up through the Acholi Restricted Area and alterations in the boundaries of the Sleeping Sickness areas and Game Reserve were necessary.

65. Drug prophylaxis is in force in the Lake Edward Sleeping Sickness Area but has been discontinued on Buvuma Island. This was decided upon after the disease had occurred in an inoculated person. Relaxation of drug prophylaxis has made other administrative measures easier to enforce.

66. It has been suggested that the case fatality rate is lower now than in past years, but this cannot be clearly established from available data. It seems that in the early stages of an outbreak, when prompt treatment is not available, the case fatality rate is higher than in the later stages.

67. *Relapsing Fever*.—The number of cases treated at hospitals continues to decline but is still in excess of the number ten years ago.

TABLE 16
Cases of Relapsing Fever reported

District					1946	1947	1948	1949
Western Province—								
Ankole	...	...	...	...	892	343	349	327
Kigezi	...	...	...	...	24	39	37	18
Toro	...	...	...	...	21	27	22	24
Bunyoro	...	...	...	...	1	...	1	2
Buganda—								
Masaka	...	...	...	...	381	167	161	105
Mengo	...	...	...	...	35	64	10	50
Mubende	...	...	...	...	11	7	11	2
Eastern Province—								
Busoga	...	...	...	...	3	8	2	33
Mbale	...	...	...	...	...	1	...	5
Other districts	...	...	...	...	2	6	1	...
TOTAL					1,370	662	594	566
Deaths in hospital					35	19	8	11

68. There has been little change in the epidemiological features of this disease during the past twenty-five years. A permanent focus of infection exists in south-west Ankole, from whence travellers with their ticks have carried the disease to many parts of the Protectorate; but it has not yet established itself elsewhere in the Protectorate. It is difficult to judge whether the inhabitants of Ankole have developed any immunity to relapsing fever. They still form the largest numerical proportion of all races treated for the disease at Mbarara, and no information about the ages of patients from different races is available. The patients treated at Masaka and Kampala and in Busoga are mainly immigrants from Tanganyika and Ruanda-Urundi. Some may have become infected while passing through Ankole, while others were probably already infected before crossing the Uganda frontier.

69. Patients are now being treated with penicillin. The case fatality rate (treated cases) for the past two years has been under two per cent although equally good results were reported more than twenty years ago. Gammexane has been found to be a valuable prophylactic against *Ornithodoros moubata*. Immigrant labour crossing the border from Tanganyika have their clothing and bedding treated with gammexane.

70. *Plague*.—No cases have been reported since 1947. The spontaneous regression of this disease has been noted in other parts of Africa. As with the fluctuations in the incidence of sleeping sickness, cyclic changes in the climate acting upon the insect vector may have been an important factor in its disappearance. (For other relevant investigations see paragraph 227).

71. *Typhus*.—During the middle thirties, an epidemic of louse-borne typhus occurred in Kigezi, but since 1938 the reported cases of typhus have been of a different type. There have been sporadic cases among Europeans, mainly in the eastern half of Uganda, which have been attributed (without proof) to infection from the dog tick, *Rhipicephalus sanguineus*. In the past four years, two new forms of the disease have been recognised, both confined apparently to Mengo District.

72. In the disease developed by Europeans at Entebbe, no marked primary lesion has, in the majority of cases, been noted. Sometimes a tick-bite eschar with regional adenitis occurred and was followed by generalised lymphadenitis, a febrile episode and rash. The response to chloramphenicol was dramatic. Serological agglutinations to *Proteus* OX 19 and OXK did not usually exceed 1/40.

TABLE 17
Typhus—Total cases reported

	1945	1946	1947	1948	1949
Cases reported	8	34*	69†	81‡
Deaths in hospital	1	3	2	...

NOTE.—* 2 cases in Europeans.

† 6 cases in Europeans.

‡ 8 cases in Europeans.

73. The majority of African patients in Mengo lived near Nakifuma, and the disease here is believed to be of the flea-borne murine type. It is possible that cases in other parts of the Protectorate have been overlooked through the absence of serological examination. *Rickettsia* morphologically resembling *R. mooseri* have been isolated from some patients.

(2) HELMINTHIC DISEASES

74. Table 18 sets out the number of stool examinations carried out at certain district hospitals, with the percentage of infestation with helminths of public health importance.

TABLE 18
Results of stool examination at certain hospitals

	Arua	Gulu	Hoima	Masaka	Entebbe	Jinja	Mbale	Soroti
Total examinations	1,882	2,621	1,141	2,325	1,515	1,474	2,791	631
	%	%	%	%	%	%	%	%
Ankylostomes ...	9.7	44	32	24	20	31	28	18
Ascaris ...	1.3	7.5	14	4.3	3.0	1.6	1.3	0.6
Schistosomes ...	5.4	17	3.9	0.2	0.9	2.1	0.4	0.9
Taenia ...	1.0	2.0	3.9	3.1	3.8	4.6	1.4	1.9

75. Both urinary and intestinal schistosomiasis occur in Uganda, often together in the same district. No distinction is made between the two forms in the routine returns of diseases.

76. *Intestinal Schistosomiasis*.—An early record of the disease is that of McConnell who, in 1921, reported from the West Nile District a patient with carcinoma of the liver associated with schistosomiasis. Surveys carried out between that date and 1925 showed that 40% of those examined were infected with *S. mansoni*. However, the numbers treated in the whole Protectorate annually during the next ten years did not exceed double figures. The numbers then began to rise and increased sharply after 1940, exceeding 1,000 in 1947.

77. The largest number of patients with schistosomiasis due to *S. mansoni* are reported from the Acholi and West Nile Districts. The infection is also known to occur in practically every district of the Protectorate.

78. High infection rates with *S. mansoni* occur only in strictly localised regions where the snail vector is found, and stool surveys in other parts of the district may give very different results. Thus, in Bunyoro, the percentage of stools found positive in patients at Hoima is much lower than the percentage found in normal persons along the shores of Lake Albert where, at one school, twenty-five per cent of the children were found to be infected. At Katwe on Lake Edward (Toro District), ten per cent of persons having abdominal complaints were found by Professor J. Schwetz to be passing schistosome ova. Lake Bunyonyi (Kigezi District) at 6,300 feet, provided a small epidemic in 1947, and the continued existence of the infection has been confirmed.

79. Away from the areas of widespread infection in the north-west of the Protectorate only sporadic cases of the disease are seen, but this probably indicates that the foci of infection have not yet been located: Buganda could claim that no cases of schistosomiasis had been recorded from 1905 until 1930, but faecal specimens were occasionally found to be positive. Between 1925 and 1935 0·4 per cent of all stools examined in Kampala contained ova of *S. mansoni*. In 1949, the percentage was nil, but in Entebbe, Masaka and Jinja, the percentage incidence was 0·9, 0·2 and 2·1 respectively.

80. The snail vector of this form of schistosomiasis is the flat coiled *Planorbis*, the species varying in different parts of the Protectorate. It is found in lakes and dams, apart from some crater lakes which are too saline, and in swamps under favourable conditions. Fishermen are particularly prone to infection. To break the cycle of transmission through the snail, it is not sufficient merely to encourage Africans to build latrines. They must be urged to use them, and to avoid indiscriminate defaecation at the water's edge.

81. *Urinary Schistosomiasis*.—The urinary form of schistosomiasis is widespread in the Lake Kioga basin. Lango to the north of the lake and adjacent parts of Busoga and Buganda to the south have provided sporadic outbreaks throughout the past twenty years. A

common sequence of events is for schools to be found in which one-half or more of the children are infected. The disease dies down and interest slackens, until a few years later the focus springs into prominence once more.

82. Professor J. Schwetz of the Free University of Brussels visited south-west Lango during October, 1949. Through the courtesy of the Institute des Rescherches Scientifiques de l'Afrique Centrale, he and his trained assistants were able to spend a month investigating the transmission of the disease. A preliminary survey had revealed the presence in borrow-pits, where the schoolboys bathed, of a small spiral tower-shaped snail *Pyrgophysa forskalii* which had been suspected of being the vector in Kavirondo and in Mauritius. This snail was shown not to be infected with schistosome cercariae in Lango. The vector was eventually located in scattered water-holes and ponds—*Physopsis nasuta*. White mice were exposed to the cercariae from these snails and some were found later to be infected with *S. haematobium*.

83. Some of the children were treated with tartar emetic and others with miracil. The preliminary results showed that two-thirds of the children treated with tartar emetic remained infectious, while a few of those treated with miracil subsequently passed dead ova.

84. The seasonal and secular fluctuations in the incidence of this disease suggest that its propagation is favoured by the drying up of water-supplies. The contamination of the residual supply then has a more serious outcome. Experiments have been conducted by the Medical Entomologist, who found that gammexane applied at a dose of 10 mgm. per square metre killed snails, as well as small fish.

85. *Dracontiasis*.—A few cases continue to be reported from the north-east of Teso District where there are few bore-hole pumps and water is scarce in the dry season. Cases were reported from Lango and from eastern Acholi adjacent to the Lango border. In the West Nile District only nineteen patients were treated at the district hospital, but 349 were seen at dispensaries. Of these, Rhino Camp returned most cases; Aringa, where surveys in former years showed that twenty-seven per cent of the population was infected, returned only fifty-three cases. The installation of bore-hole pumps has led to a marked improvement in this area. The vector *Cyclops coronatus* varies in abundance from year to year, and with the long incubation of ten months the place of infection is often difficult to locate.

86. *Onchocerciasis*.—Infection with *Onchocerca volvulus* is found in the vicinity of the Nile, in the forests of Kigezi, on the lower slopes of Ruwenzori and possibly in the Budongo forest and on Mount Elgon. In some regions skin manifestations are common—in Kigezi sixty-seven per cent of 1,800 persons examined showed micro-filaria in skin-snips. Blindness is not a prominent feature but larvae may occasionally be seen in the anterior chamber of the eye. The usual insect vector in Uganda is *Simulium damnosum*. In Kigezi, micro-filariae have been shown to develop in the stomach of *S. naevei*: this, though scarce, is

the only species found, the larvae breeding on the backs of crabs in the streams.

87. Now that work has begun on the construction of the dam at Jinja, *Simulium damnosum* has assumed greater practical importance. Wearing long trousers and using repellants such as dimethylphthalate gives some protection against the bites. The possibility of eradicating the insect completely is being considered. Experimental attempts to control larval breeding by varying the water level or by treating the water with DDT have been carried out. Surveys are in progress to determine the location of all breeding places in the Nile and its tributaries. This knowledge is required to assess the practicability of killing the adults by spraying residual insecticides from the air on foliage near the breeding places.

(3) DIRECT INFECTIONS

88. *Anthrax*.—Blackquarter in cattle has been confused in the past with anthrax, but there is no doubt that true anthrax has been endemic among the cattle of the pastoral tribes of Ankole as far back as records go. The mortality among human cases has continued to be low, and difficulty has been experienced in demonstrating the organism. In some outbreaks the organism has been shown to be an atypical *B. anthracis*, non-pathogenic to guinea-pigs.

89. An outbreak occurred in Bunyoro District, near the entrance of the Nile into Lake Albert, where anthrax had not previously been recorded. Fifty per cent of the first forty patients were children under fifteen, many of whom contracted the disease by sitting on infected hides. Nineteen deaths were reported, and the case fatality rate was about fifteen per cent.

90. Anthrax associated with typical virulent *B. anthracis* was reported from Mengo District, from contact with cattle imported from Teso. Cases also occurred in Soroti and Bugondo, from whence the cattle were shipped to Mengo. Fourteen cases occurred, with one death.

91. *Cerebro-Spinal Meningitis*.—Sporadic cases of cerebro-spinal meningitis had been reported from Karamoja in 1948, and in January, 1949, there was an epidemic in which 142 cases and nine deaths were notified. The majority of patients were treated in a temporary isolation hospital. In November another outbreak occurred at Gogonyo, in Mbale District, where sixty-five patients were treated by the Catholic Mission, with no deaths. A third outbreak was discovered in the Game Reserve near the Murchison Falls, where practically every inhabitant of the isolated village was attacked.

TABLE 19
Cerebro-Spinal Meningitis—Annual notification

				1945	1946	1947	1948	1949
Cases	...	...	...		
Deaths	...	...	...	2,842	6,348	2,630	594	550
				350	684	505	159	94

92. *Leprosy*.—Government hospitals treated 564 patients during 1949, compared with 576 in 1948 and 689 in 1947.

93. The incidence of leprosy is higher towards the northern and western borders and lower in the centre of the Protectorate. The highest known rates are found around Ruwenzori, in the Nilotic areas of Bunyoro, and in the West Nile District.

94. The Annual Medical Report for 1931 gives the results of a leprosy survey covering two and a half millions of the native population of Uganda. It is obvious that all these people could not have been scrutinized individually. Moreover, the early tuberculoid and indefinite macular lesions can be recognized only by experienced observers, and the expected ratios of the various clinical types are not realised in the figures given. The 1931 results are thus unfortunately of little value in deciding whether the incidence of leprosy has changed during the past twenty years, but are given in Table 20 as a matter of historical interest.

95. During 1949 the Inter-territorial Leprologist examined 35,000 persons in Central and Eastern Busoga, and found an overall incidence of 33 infected persons per thousand persons examined. The rate varied from 17 to 58, but as the places with the lowest and the highest rates were only 10 miles apart it is difficult to decide whether there is any real difference in the incidence of the disease throughout the district or whether the rates merely reflect errors of sampling.

TABLE 20

Leprosy Surveys—Rates per 1,000 population

					1930	1948-1950
Buganda—						
	Sesse Islands	...	...	...	...	19
	Mubende	...	...	...	1·1	} 6
	Mengo	...	...	...	3·0	
	Entebbe	...	...	...	0·5	
Eastern Province—						
	Teso	...	...	...	5·7	30·5
	Mbale	...	...	...	3·6	52
	Busoga	...	...	...	7·2	33
Western Province—						
	Bunyoro	...	...	...	3·1	117
	Toro	...	...	...	...	116
	Ankole	...	...	...	...	...
	Kigezi	...	...	...	1·7	6
Northern Province—						
	West Nile	...	...	...	...	118
	Kitgum	...	...	...	2·5	17
	Gulu	...	...	...	3·2	26
	Lango	...	...	...	12·6	2·72

96. Information has been sought about the extent of disability caused by leprosy and the economic importance of the disease. The death-rate ascribed to the disease in Bunyoro is low (0·2 per thousand population) amounting to only one per cent of all deaths. Patients with

deformities and mutilations are not common and are usually elderly people who are approaching the natural end of their economic life. Poll-tax exemption occurs in leprosy at an earlier age than usual and may account for one-quarter of all exemptions in the worst areas. The association of high leprosy incidence and low fertility has been investigated in Bunyoro, but with inconclusive results; returns from the leprosy settlements show that the number of babies born to patients is up to expectations.

97. Grants are given by Government towards the routine maintenance of the settlements and drugs are provided free, while special grants are made as occasion arises. Since the discovery of the sulphone drugs and the ensuing greater prospects of cure, Government expenditure on leprosy has risen sharply, both on the drugs themselves and on medical supervision.

98. *Lake Bunyonyi Leper Colony—Bwama Island, Kigezi District.* (Church Missionary Society).—The colony reports steady progress under the care of Miss G. Mash. The number of admissions has increased slightly. Approximately ninety per cent of those admitted were lepromatous in type and were in poor physical condition. Difficulty in feeding was experienced owing to the failure of the rains and the poor crops. An outbreak of whooping cough attacked one village and caused the death of two infants.

99. The babies' ward contains twenty healthy children born of lepromatous mothers, and there are twenty-nine children in the creche. Larger doses of hydnocarpus oil are being used for treatment, given intradermally. The administration is arranged so that patients may have a second voluntary injection each week, and the response to this has been encouraging. Owing to the absence on leave of the medical officer, treatment with sulphetrone could not be started, and building activity during the year was confined to erecting grass huts and latrines.

TABLE 21

Resident at end of 1948 ...	...	747
Admitted during year ...	...	137
Total births ...	...	...
Total deaths ...	...	16
Discharged or absconded ...	...	52
Remaining at end of year ...	...	816

100. *Nyenga Leper Colony, Kyagwe, Buganda* (Order of Saint Francis, R.C.M.).—During the year, the accommodation was increased by the completion of a new dormitory for twenty patients and a ward containing eight beds. In addition, seven temporary buildings have been erected, each holding four beds. The total accommodation is now 195 and as many as seventy-three patients have been accommodated on the floor. Restriction had to be placed upon the number of patients admitted, and 147 applicants were refused admission; the capacity of the colony has been strained to its utmost.

TABLE 22

Resident at end of 1948 ...	...	201
Admitted during year ...	...	130
Total births ...	...	1
Total deaths ...	...	6
Discharged or absconded ...	...	93
Remaining at end of year ...	...	233

101. Hydnocarpus oil has been given in doses of up to 30 mls. weekly by combined subcutaneous and intradermal injections. By the end of the year forty patients, all lepromatous, were receiving sulphetrone therapy, the dose being from 3 to 6 grams daily. Yeast and iron were also given. In the last four months, hydnocarpus oil was added as a routine. Although some patients have been under treatment with sulphetrone for fifteen months, none are yet bacteriologically negative, but the clinical and subjective results are encouraging.

102. *Namagera Leper Village, Buluba, Busoga District.* (Order of Saint Francis, R.C.M.).—During the year, Dr. H. C. Quin took up residence in the settlement and the administration of sulphetrone was started. At the end of the year, 105 patients were receiving this treatment, the dose varying from 3 to 5 grams in suitable cases on six days of the week. A total of 3,046 microscopic examinations were made during the year. Intradermal hydnocarpus oil is given for tuberculoid cases. Most of the younger patients showed marked improvement; two were discharged on parole as cured.

103. Three children were infected with sleeping sickness near the settlement, but no further cases occurred after all the patients were given prophylactic injections of antrypol. All incapacitated patients receive a basic ration of food, the amount given being reduced in proportion as they are able to support themselves.

104. Following the leprosy survey by Dr. Ross Innes in November there was a large increase in the number of patients asking for admission, and the admissions greatly exceeded those in the previous year. Many were advanced cases who claimed that they had not known of the existence of the leper village before.

TABLE 23

Resident at end of 1948 ...	...	300
Admitted during year ...	...	146
Total births ...	...	5
Total deaths ...	...	11
Discharged or absconded ...	...	89
Remaining at end of year ...	...	351

105. *Kumi and Ongino Leprosaria, Teso District.* (Church Missionary Society).—During the year the European staff assisting the Medical Superintendent has been greatly augmented, the accessions being a worker supported by B.E.L.R.A., a nursing sister and a welfare worker.

106. The school curriculum has been drastically remodelled and given a more practical bias. Emphasis is now placed on agriculture and carpentry for boys and domestic hygiene for girls. A model farm has

been started at Ongino on the lines of the Teso Prison Farms, to encourage manual labour and communal activities by the mixed tribes. Houses are being erected of murram blocks, and workers are assisted by two patients who were formerly employed by the Public Works Department as bricklayers.

107. Sulphetrone treatment was started in March, the dosage being 3 grams daily for children and 4 grams for adults, supplemented by ferrous sulphate tablets. One week in six is free from treatment. A modified lepra reaction has been noted from the use of sulphetrone but permanent improvement results if the drug is continued throughout the period of pyrexia. Hydnocarpus oil is given in higher dosage by varied techniques.

108. The increase in the turn-over of patients is striking. The majority of those who absconded were Iteso, while the new admissions were predominantly Bagishu. It has been noted that the Bagishu show many indeterminate macular lesions which react less favourably to infiltration with hydnocarpus oil than tuberculoid lesions.

109. The Medical Superintendent surveyed an area within Ongino Gombolola examining eighty-five per cent of the people in the area. He found 30.5 cases of leprosy per thousand but none with lepromatous lesions.

TABLE 24

Resident at end of 1948 ...	...	528
Admitted during year ...	...	408
Total births ...	...	7
Total deaths ...	...	25
Discharged or absconded ...	...	370
Remaining at end of year ...	...	548

110. *Rabies*.—A number of patients were admitted to Tororo hospital for treatment of bites by dogs believed to be rabid. Most of the patients had come from Kenya, but none died, and there was no confirmatory evidence that the disease was rabies.

111. *Smallpox*.—Several small isolated outbreaks of variola minor occurred during the year, forty-seven cases with one death being notified.

TABLE 25

Smallpox—Total cases reported

	1945	1946	1947	1948	1949
Cases reported ...	1,558	581	389	192	47*
Deaths reported ...	5	0	5	5	1
<i>Districts—</i>					
Lango ...	242	272	191	58	5
Mbale ...	257	20	9	17	7
Busoga ...	407	24	1	22	13
Masaka ...	135	55	21	3	22
Others ...	517	210	167	92	—

NOTE.—* 38 cases only notified by weekly infectious disease telegrams.

112. Vaccination is carried out on infants, school children and prisoners, and at other times when people are conveniently gathered together as for sleeping sickness examinations. Mass vaccination campaigns have been abandoned, and emphasis is placed on vaccinating all contacts when cases occur.

113. The mild type of smallpox introduced in 1943 had a low mortality of only one per thousand cases but in recent years the mortality has been rather higher. It may be that the same phenomenon is appearing in this disease as in meningococcal infection—during a widespread epidemic all cases are well reported, whereas at other times the milder cases tend to be neglected and so are not reported.

114. *Tuberculosis*.—Fears have been expressed that this disease is becoming more common among the African population, but there has been no unequivocal increase in the number of cases reported from Government hospitals in recent years.

TABLE 26
TUBERCULOSIS—HOSPITAL CASES AND DEATHS
Pulmonary Tuberculosis

				1946	1947	1948	1949
Patients seen	...	...	...	483	842	794	629
Hospital admissions	...	...	...	434	404	415	426
Deaths	...	...	...	117	119	116	110

Other forms of tuberculosis

Patients seen	...	...	...	141	149	127	173
Hospital admissions	...	...	...	117	88	104	146
Deaths	...	...	...	18	9	14	31

115. The proportion of all hospital admissions and deaths due to pulmonary tuberculosis, expressed as the rate per thousand of all cases, is shown in Table 27.

TABLE 27
Pulmonary Tuberculosis—Rates per 1,000

				1912-20	1926-30	1931-34	1936-39	1946-49
<i>All Hospitals—</i>								
Patients seen	...	...	...	0.2	0.4	0.8	1.0	1.0
Admissions	...	...	...	1.8	4.0	7.0	8.6	5.3
Deaths	...	...	...	8.5	23	32	48	43
					1927-30	1931-34		1948-49
<i>Mulago Hospital—</i>								
Patients seen	...	...	...		5.1	4.7		2.9
Admissions	...	...	...		9.1	11.3		11.8
Deaths	...	...	...		42	66		108

116. The above data suggest that there has been no marked change in incidence during the past twenty years. The lowest proportion of all patients who are diagnosed as tuberculous is in dispensaries; the proportion is higher in district hospitals and greatest at Mulago Hospital, so that more accurate clinical, bacteriological and radiological diagnosis may have some bearing on the increased numbers.

117. It has been noted, both in recent years and twenty years ago, that the disease is seen most often in immigrants from Tanganyika and Ruanda-Urundi.

118. The ratio of pulmonary to non-pulmonary forms of tuberculosis may throw some light upon the evolution of the disease in the community, since non-pulmonary lesions are more frequent in non-immune persons.

TABLE 28

Ratio of pulmonary to non-pulmonary tuberculosis

	1903-07	1908-12	1922-26	1926-30	1931-34	1936-39	1946-49
C.M.S. Hospital							
Mengo	0.6	1.4	1.3	3.7	...	...	...
Government Hospitals	...	...	...	3.7	4.3	3.9	3.7

119. In England and Wales during the same period, the ratio increased from 3.3 (in 1901) to 4.6 (in 1931).

120. A survey of tuberculin sensitivity was carried out by Dr. W. Santon Gilmour, O.B.E., at the end of 1948 and in the early months of 1949. During the survey over 6,000 Africans were tested with 0.01 mgm. old tuberculin, and 4,335 returned at least once for the results to be read. The tuberculin was flown from England and kept on ice, fresh dilutions being made daily. The negative reactors were tested with 0.1 mgm. but only about ten per cent returned for the final reading. If the known results are representative of all reactions, the following percentages should be increased by one-third to give the proportion reacting at 1/1,000 (i.e. the lower dilution).

121. For the whole series of tests, 36 per cent of the Africans were found to react, the proportion being lower in children (17 per cent) and higher in adults (46 per cent). Little difference was noted in the percentage of reactors among adults in different parts of Uganda, but the immigrant tribes showed a rather higher percentage reacting. The over-all percentage for *indigenous* tribes was 31.4 per cent.

122. Attention was also given during the survey to factors which might affect the incidence of tuberculosis, and it was found that children living in densely populated areas, as well as workers in a tobacco factory and families living in police lines, gave a slightly higher positive reactor rate than the average. To what extent this was due to the age, race and sex composition of the samples cannot be ascertained.

123. It is of interest that Mbarara (Ankole) is the only hospital which treats more cases of non-pulmonary than pulmonary tuberculosis. It is known that tuberculosis is common in the longhorn cattle of Ankole, where the Bahima drink milk raw, while among the Zebu cattle of northern and eastern Uganda, tuberculosis in cattle is relatively uncommon. The bovine type of *M. tuberculosis* is not believed to be common in human infections in Uganda, even in Ankole where non-pulmonary tuberculosis is common and the local cattle are heavily infected (Annual Report for 1937, page 26).

124. *Enteric group of fevers*.—A progressive rise in the number of cases of typhoid fever is shown by the following returns of hospital admissions.

TABLE 29
Enteric group of fevers—Return of hospital admissions

			1939	1946	1947	1948	1949
<i>Typhoid—</i>							
Patients	...	...	197	274	225	342	469
Deaths	...	...	60	54	44	56	77
<i>Paratyphoid—</i>							
Patients	...	...	10	4	10	17	15
Deaths	...	...	1	0	0	2	0

125. Distribution by Provinces for 1948 and 1949 is shown in Table 30.

TABLE 30
Cases of typhoid

				1948	1949
Buganda	...	...	...	200	312
Eastern Province	...	...	...	77	74
Western Province	...	...	...	56	78
Northern Province	...	...	...	9	5

126. The number of cases reported from Mengo District has doubled in the past three years, most of the cases occurring in Kyadondo County, where the population is very dense. A high proportion of the cases were among immigrants from Tanganyika and Ruanda-Urundi, whose standards of sanitation are particularly low. Spread appears to be mainly by personal contact and the contamination of food by human carriers and by houseflies breeding in defective latrines. In only exceptional instances has there been evidence of spread of infection through water supplies. Investigation of outbreaks has frequently brought to light cases who had not sought medical aid. Forty men working on a new water supply were examined and four of them gave positive Vi agglutinations. Two minor epidemics occurred near Kyotera in the south of Masaka.

127. There is a regular seasonal incidence, cases being fewest during the dry season and rising to a maximum during the rains in the latter half of the year.

128. In the Eastern Province, the disease is probably more widespread than the hospital admissions suggest. In Mbale District, twenty-three cases were treated at the district hospital and another twenty-seven at rural hospitals, but altogether some 193 cases are believed to have occurred.

129. *Venereal diseases*.—Many District Medical Officers have commented on the high incidence of these diseases; they have pointed out that the situation has shown no improvement in spite of the therapeutic efforts expended, and fears have been expressed that the diseases are becoming more prevalent, particularly gonorrhœa. It has been suggested that the net result of the more potent drugs introduced in recent years has been to assuage any fears the African might have had of these infections. Some African Local Governments have raised these same issues and have asked for special consideration to be given to the problem. It is difficult to judge the precise incidence of these diseases or to what extent it has changed.

130. The numbers attending hospitals and dispensaries reflect largely the availability of popular methods of treatment. Dispensaries which do not use arsenical injections and penicillin do not attract many patients for treatment.

TABLE 31
Venereal Diseases—Cases treated at hospitals

			1939	1946	1947	1948	1949
<i>Syphilis</i> —							
Males	...	...	12,089	21,480	26,066	26,547	26,472
Females	...	...	9,788	17,964	19,398	21,307	21,838
<i>Gonorrhœa</i> —							
Males	...	...	5,762	13,628	19,983	22,907	21,075
Females	...	...	1,955	6,470	10,128	10,253	10,764

131. The recorded ratio of patients attending for syphilis to all patients has not changed during the past ten years. It is lower than in the years prior to 1939, probably because dispensary returns are not now included in the totals. The proportion of patients presenting themselves with gonorrhœa has doubled during the past ten years, and had doubled in the previous ten years.

132. Venereal disease occurs throughout the Protectorate. It is commonest in Buganda and least common in the parts situated furthest away from Buganda, such as Kabale and the Northern Province. Blame for the spread of these diseases has been attributed to soldiers returning from the army or labourers returning from work outside their own districts. The incidence in districts, however, bears no relationship to the extent to which men have been recruited, either for the army or

for contract labour. In Teso and Lango, gonorrhoea appears to be unduly common; in the early stages of the war, it led to many medical rejections of recruits from these districts.

133. An indication of the frequency of syphilis in the general population can be obtained by noting signs of syphilis at post-mortem in patients dying from unrelated causes; in one series examined, about half the deceased who became sexually mature within the past thirty years showed evidence of infection. Syphilitic heart disease is responsible for many sudden deaths.

134. Treatment for gonorrhoea is mostly undertaken in hospitals, using sulphonamides and artificial pyrexia; penicillin is reserved for sulphonamide-resistant cases. Some districts report thirty per cent of all cases treated to be sulphonamide-resistant. Patients with syphilis are generally treated as out-patients, special efforts being made to give full courses to infected ante-natal patients and infected infants. Treatment of the infected partner is advocated and is meeting with some success among married couples.

135. *Yaws*.—The number of patients treated at Government hospitals fell sharply in 1949, after having been at a high level since 1945.

TABLE 32

Yaws

Cases treated at hospitals—	1939	...	24,842
	1948	...	35,913
	1949	...	26,191

136. Yaws is commonest, to judge by hospital returns, at Kabale and Arua (nineteen per cent and seventeen per cent of all patients treated respectively). The proportion is low in the Eastern Province, except in the area immediately bordering on Lango, and is low in Buganda, except in Masaka.

137. Wide variations may occur within a single district. In Toro, the percentage of yaws among the patients seen at different dispensaries varies from 3·3 to 25; it is highest at the dispensaries where Bakonjo and Baamba are treated. The average for all dispensaries in Toro is fifteen per cent, while the proportion for the district hospital is only six per cent.

138. In Lango, 3,783 patients attended the district hospital on account of yaws, being 700 fewer than in the previous year. An additional 22,447 were treated in a special yaws campaign which was still in progress at the end of the year. During the year, 247,715 persons were examined; all with open yaws lesions or lesions likely to become infective, including ulcers of more than one month's duration, were given a course of treatment.

139. The campaign was supervised by a European medical officer having four teams working from separate centres. The treatment consisted of four weekly injections of bismuth and arsenical preparations.

140. To test the efficacy of the campaign in eradicating the disease, the survey was repeated at Bala nine months after the local population had been inspected and 2,044 cases treated, of whom 833 had primary or secondary yaws. Only forty-two infective cases were discovered, the treatment campaign having reduced the incidence of such cases by ninety-five per cent. The cost during 1949 was ~~£4,977~~ made up as follows:

				£
Salaries and allowances of medical officer and assistants	...	...	...	2,022
Transport	...	...	...	1,165
Drugs	...	...	...	2,800
Equipment	...	...	...	611
				<u>£6,598</u>

141. *Respiratory diseases*.—Examination of the returns in respect of this complex of disease indicates that the allocation to one particular heading is often a matter of personal idiosyncrasy.

TABLE 33

Respiratory diseases—Cases treated at hospital

				All Patients	Admissions	Deaths
Whooping Cough	...	...	...	1,102	419	15
Influenza (with and without respiratory complications)	...	...	...	11,250	582	1
Bronchitis	...	...	...	4,917	1,286	19
Pneumonia—						
Broncho	...	...	...	1,569	1,207	165
Lobar	...	...	...	2,644	1,319	169
Otherwise defined	...	...	...	1,323	837	51
Other respiratory diseases	...	...	...	69,618	1,910	45

142. “Influenza without respiratory complications” and the residue of “other respiratory diseases” are mainly seen in out-patients and have a negligible mortality. Pneumonia is an in-patient disease carrying a relatively high mortality. The marked fall in the case fatality rate of this disease can be attributed to the newer therapeutic drugs.

TABLE 34

Pneumonia admissions—Percentage case fatality

				Broncho Pneumonia	Lobar Pneumonia	Otherwise defined
All hospitals—						
1936/39 (average of annual rate)	...	...	...	23·8	22·3	22·3
1946/49 (average of annual rate)	...	...	...	11·4	8·2	7·0
Mulago Hospital—						
1948	...	...	...	30	2·6	1·4
1949	...	...	...	24	7·7	9·0

143. *Virus diseases*.—A few patients with acute poliomyelitis and encephalitis lethargica are reported each year, but the validity of the diagnosis is often in doubt. There are other conditions—often fulminating and causing death before adequate investigation can be undertaken—which may be caused by virus infection.

144. Mengo encephalomyelitis virus was first isolated from a rhesus monkey at the Yellow Fever Research Institute at Entebbe, and infection in man has subsequently been described. The virus has been isolated from *Taeniorhynchus fuscopennatus* and the mongoose, and immune sera have been collected from persons living in the Budongo Forest. This virus has been shown to be distinct from any of the usual strains of poliomyelitis. It is related to viruses found elsewhere in the tropics in wild rats, causing in man a three-day fever with neurological signs.

145. *Yellow Fever*.—The sera of children living on Kome Island were examined, and some specimens from children under five years of age gave positive mouse protection tests against yellow fever virus. These results confirm the existence there of jungle yellow fever, which is conveyed from monkey to man by *Aedes africanus*. (See 1939 Annual Report, page 33).

146. *Diseases of the Eye*.—These diseases rarely kill the patient; they rarely, in fact, lead to admission as in-patients, accounting for only four per cent of all admissions. Their importance lies in their disabling effect, especially in debarring the patient from literacy and intellectual advancement. Sir Stewart Duke-Elder reported on a limited survey carried out in Uganda, and gave his impressions of the main causal infections, viz. trachoma, gonorrhoea and other conjunctival infections, syphilis, onchocerciasis (in certain localities), tuberculosis and leprosy; all except the first were secondary to systemic disease. He pointed out the large number of diseases of the eye the cause of which is obscure and in particular referred to inflammatory conditions of the inner eye which are often mistakenly labelled as syphilitic. He estimated trachoma to affect fifteen per cent. of the African population, although the distribution was patchy.

147. The hospital returns of trachoma vary widely as between races and different districts. No cases have been recorded from the European Hospital for the past two years and the rate recorded at the Asian Hospital is one-half that at African hospitals. Buganda returns rather a higher rate than the other provinces, except Entebbe, where the rate is remarkably low (0.2 per thousand patients). The rate at Mbarara Hospital has remained high (twenty-three per thousand patients) over the past two years. No reason for the wide differences between districts can be discerned.

D. Health Education

148. Most of the preventive measures needed to improve the standard of health require the efforts of the people themselves and a

conscious endeavour on their part to safeguard their own health and that of their families. Public co-operation is also required to abolish dangers which may not immediately threaten the individual but may cause illness to other persons in the community. One of the major tasks of health education is to stimulate the development of this co-operation.

149. It has been realised that success in teaching health measures depends mainly upon arousing the interests of the listeners. Some direct personal benefit must be seen as a result of the action recommended, or nothing will be done. The teaching must link up with deeply-rooted interests, such as the well-being of children and family prosperity and the need for strength to grow crops. Care is being taken to emphasize the part played by all medical workers, including nursing staff and midwives, as members of a health educational system. Advice from these workers carries special weight.

150. During the year, greater efforts were made along these lines. Talks on the causation and prevention of disease were given at dispensaries and clinics both by local African staff and by visiting European officers. Talks have also been given by health staff and medical officers at schools and at communal meetings in Lukiko halls, while more elaborate demonstrations have been arranged by the Department of Public Relations and Social Welfare in co-operation with officers of the Medical Department.

151. The subject matter of the demonstrations has included the value of latrines, sound house building, safe water supplies, etc. Efforts directed towards the prevention and amelioration of specific diseases have also been undertaken. In Ankole, a combined inter-departmental project had as its aim the improvement of productivity. The medical part of the campaign comprised the treatment of persons infected with ankylostomes, and the building of latrines to prevent reinfection. Films have also played their part. A film on dysentery was constructed by the Colonial Film unit, while the Walt Disney technique applied to hookworm disease and its prevention proved very successful in Buganda. Short articles have appeared in the vernacular press on such topics as typhoid, leprosy, sleeping sickness, prophylactic inoculation, the improvement of water supplies, and the choice of a site for a house.

152. Particular success has been achieved in Mengo in improving water supplies by communal efforts. When the enthusiasm of one chief and his Council has been secured and the initial results achieved, the idea gains momentum through the education of other chiefs and Councillors who come to see the work and learn what they themselves should do. The education of chiefs is also undertaken through a course in African Local Government held at Bukalasa Agricultural Station, at which lectures are given by Medical Officers on the elements of hygiene and the legal responsibilities of chiefs.

E. Maternity and Child Welfare

153. The steady expansion of these services has been maintained during 1949, both as regards ante-natal attendances and deliveries in institutions. Returns prepared by midwives at maternity centres are sometimes lacking in completeness, but the following comparison of records indicates the scale on which growth has taken place. (Table 35).

TABLE 35
Ante-natal attendances at institutions

	1946	1947	1948	1949
<i>New Cases—</i>				
Government Hospitals	28,417	33,603	34,080	34,906
Government Maternity Centres (rural)	13,251	9,984	32,500	34,758
Government total	41,668	43,587	66,580	69,664
Mission institution	19,199	23,219	24,201	28,835
Protectorate total	60,867	66,806	90,781	98,499
<i>Re-attendances—</i>				
Government	83,016	136,541	210,799	218,444
Missions	80,432	85,346	78,476	91,367
TOTAL	163,448	221,887	289,275	309,811

154. In Buganda and the Eastern Province a very high proportion of all women becoming pregnant attend either a Government or a Mission centre for ante-natal supervision. Indeed, in Mengo District, the ante-natal attendances exceed the estimated number of pregnancies by one-third; this may be explained partly by some women attending more than one maternity centre and partly by many re-attendances being recorded as new cases.

TABLE 36
Institutional Deliveries

	Government	Missions	Total
Total admissions	12,939	8,476	21,415
Admitted from ante-natal clinics	9,553	7,064	16,617
Abortions (threatened and complete)	1,040	483	1,523
Delivered at term	11,579	7,620	19,199

155. A total of 19,199 institutional deliveries were recorded, resulting in still-born children at the rate of fifty-seven per thousand births. Of the live-born children, twenty-seven per thousand died before discharge from the ward. The distinction between a miscarriage and a still-birth and between a still-born child and the death of a live-born infant is not always appreciated judging from some of the returns. The number of still-births and maternal deaths at maternity units is greater in some districts than the number recorded by the chiefs, and it is likely that events occurring outside the chief's jurisdiction may be omitted from his records. By combining the information from the chiefs with that from maternity units a closer approximation to the actual loss of life can be obtained.

TABLE 37.

Maternal Mortality and Still Births

<i>Maternal Deaths—</i>			
Chiefs' Returns	...	...	600
Maternity Units	...	...	214
Rate per thousand total births	...		6
<i>Still-births—</i>			
Chiefs' Returns	...	...	3,000
Maternity Units	...	...	1,100
Rate per thousand total births	...		30*

NOTE.—* The still-birth rate for England and Wales in 1949 was twenty-three per thousand.

156. The experience at maternity units indicates no marked variation in the still-birth rate throughout the Protectorate.

157. It is possible that the increased number of deliveries in maternity units has caused an apparent improvement in the mortality rates that is misleading, since difficult cases enter hospital and the relatively high mortality resulting from these may not always be recorded in the chiefs' returns.

158. Child Welfare clinics are maintained at some dispensaries apart from those listed as maternity centres. Although in many cases they are treatment centres rather than centres for advising mothers on matters relating to the care of their children, they attract many who might not otherwise bring their children for attention. The clinics are a social event for the women and are useful for health education.

159. *Nsambya Maternity Training School.*—The total number of students in the training school was 110, of whom fifty-four presented themselves for entry during the year. Three students in the Preliminary Training School failed to pass the terminal examination, and six others were judged to be unsuitable for training. Forty students are being trained in midwifery and fifty in general nursing. Of the midwifery students, five are general trained nurses. The acquisition of the double qualification is being encouraged, especially for those who will have charge of outlying centres. Ten students passed the examination for the certificate of the Uganda Midwives Board during 1949, and four failed.

160. The Nurses' Home has been improved by the completion of twenty bathrooms.

161. At the ante-natal clinics, routine estimations of haemoglobin levels as well as urine examinations are carried out. Provision has been made for the supervision of children between the ages of one and ten years. A total of 543 children were seen at these clinics and 1,053 mothers were seen at the post-natal clinic.

162. *Lady Coryndon Maternity Training Centre.*—Of the twenty-eight girls admitted for training in midwifery, two were unable to continue the course. Ten were already qualified nurses, of whom three were in Government service. During the year, nineteen students passed the certificate of the Uganda Midwives Board, seven thus acquiring the double qualifications in midwifery and general nursing.

F. School Health

163. A Medical Officer was engaged in the inspection of school-children in Kampala during the greater part of the year and was able to arrange treatment for some of the defects noticed. *Pediculosis capitis* infections were treated with five per cent. D.D.T. emulsion but recurrences frequently occurred. All the children were vaccinated and those showing signs of deficiency disease of anaemia were treated. There were marked differences between races: physical development was best in European children, and African children were better developed than Asian children. Hookworm and malarial infestation were common only in African children and pediculosis only in Asians. Dental caries was least common in African children and gingivitis was absent in Europeans, whilst Asians suffered most from both caries and gingivitis.

164. Treatment of other defects was carried out in the case of Africans at Mulago Hospital while non-natives were advised to make their own arrangements for treatment. It was estimated that more than fifty per cent of the Asian children failed to receive the necessary treatment, either on account of parental neglect or poverty.

165. Extensions have been carried out at both the European and the Indian Primary Schools and no overcrowding was recorded. Sessions are duplicated at the Indian School and additional temporary accommodation has been provided. Indian private schools were found to be badly designed; lighting and ventilation were unsatisfactory and classrooms were overcrowded. Overcrowding has also been noted in African schools.

G. Environmental Hygiene

(1) HOUSING AND TOWN PLANNING

166. The Town and Country Planning Ordinance, 1948, was implemented in 1949 by the declaration of a planning area for Kampala, statutory powers for the area being delegated to the Kampala Municipal Council.

167. Attention has been given to planning schemes for Mukono, Kalisizo, Lugazi and Mityana, aiming among other things at abolishing ribbon development. In Entebbe, many commercial leases will expire in the near future and plans for better development are in hand. The Buganda Government passed a Shop Law, and a Building Law was in preparation by the end of the year.

168. Mbale in the Eastern Province has expanded considerably in recent years. Kakunguru's estate has been purchased for residential development.

169. Government housing is now catching up with demands. The new type of flat is popular and often preferred to a larger house, being easier to run and enabling domestic staff to be reduced to a minimum. The housing situation for Asians is still unsatisfactory. A survey of overcrowding in the bazaar area at Jinja put the average number of occupants in Asian plots at seventeen, and here as elsewhere it has been necessary to limit the ingress of immigrants on account of lack of accommodation.

170. *African housing.*—The housing estates for Africans near Entebbe (Katabi) and Kampala (Naguru and Nakawa) have been extended and African housing estates are being developed in or near Jinja, Gulu and Hoima. The prevailing high rents tend to encourage overcrowding with its obvious dangers, and too great a proportion of the wage is often diverted from expenditure on food. Attempts have been made to find designs and materials which will enable housing to be provided at lower cost. In this connection, aluminium sheeting has become popular, especially for the housing of estate labour. A ceiling beneath an aluminium roof is not now a legal requirement, and as long as the sheeting remains untarnished it is an effective heat reflector.

171. Any general improvement in the housing standards of Africans depends largely on the provision of sufficient artisans of the right calibre. Too often the African seizes on the superficial and neglects the fundamentals necessary for sound construction. Cement for the floor surface is of obvious value; but cement for the damp-proof course is hidden from the eye and is accordingly omitted. Much needed building craftsmen are now being turned out from Government artisan training centres which were originally developed for the benefit of ex-soldiers.

(2) WATER SUPPLIES

172. Piped supplies were at one time deemed feasible only for the larger centres of population near the Lake, where ample water of good quality is available. The practicability of smaller plants, using bore-hole supplies, has fostered schemes for supplying all the main townships with piped water; to do this it has proved necessary to draw upon sources such as rivers and swamps which are liable to be contaminated. With the exception of a few supplies derived from bore-hole pumps, all are chlorinated; and skilled supervision of, and constant vigilance over, the purification arrangements are required. Work on the installations in hand proceeded slowly owing to shortage of materials and the new installation at Mbarara and the extensions at Masaka were uncompleted at the end of the year. Bore-holes have been extended in rural areas; they are the safest source of supply but the high iron content of the water in some areas is a disadvantage.

173. A successful campaign to improve primitive rural water supplies was begun in Mengo District, and in two gombololas twenty-five springs serving a population of about twenty thousand persons were renovated at an average cost of Shs. 15 each for materials. The work was carried out by the inhabitants themselves under the guidance of health staff and was inspired by the enthusiasm of individual chiefs and councillors; the finished works were used as demonstrations for visiting chiefs and others from neighbouring areas. A survey in four gombololas around Kampala showed that there were 144 protected springs and 160 still unprotected. Twelve of the protected springs had dried up during 1949.

(3) FOOD SUPPLIES

(a) MARKETS AND ABATTOIRS

174. Extensions were found necessary at the Kampala abattoir, and work was commenced on new slaughtering-pens and a stomach washing room. A new market is under construction at Kabale.

175. Much meat is sold elsewhere than from recognised markets, and as far as possible this is inspected after slaughter by African Health Inspectors. In townships this work is usually undertaken by members of the Veterinary Department and there is an increasing awareness on the part of chiefs of the need for meat inspection. The disposal of condemned carcasses is not so popular and, as the occurrence of human anthrax indicates, is frequently evaded.

(b) TRADE PREMISES

176. Bakeries in many townships are unsatisfactory in design and construction, making it difficult to maintain cleanliness. As in the case of eating houses, they are often built on overcrowded residential and trading plots and were not designed originally for handling food.

177. Milk supplies continue to show improvement, but continuous watch over suppliers and middle-men is required in order to detect watering and dirty methods of cleansing. Legal action is difficult in areas where facilities for tests acceptable to the courts cannot be provided. The use of proper milk churns is being increasingly insisted upon.

(4) URBAN SANITATION

178. On 1st January, 1949, Kampala became a Municipality and the Medical Officer of Health has issued his first Annual Report for that year.

179. Township sanitation throughout the Protectorate has been hampered by shortage of supervisory staff, although the supply of materials for new works and repairs improved. The standard of design and construction of houses and commercial buildings is showing a steady improvement, and bitumen surfacing of township roads is reducing dust and mud. Town planning is in active progress and changes for the better are apparent; but overcrowding still exists in many Townships, and the older buildings are often neglected.

180. Most Government houses now have water-borne sanitation with septic tanks, Kampala having a public sewage disposal system. In smaller townships with inadequate water supplies, this is not yet possible, and the great majority of premises use the bucket system. Difficulty in obtaining labourers for the collection of night-soil has led to the improvement of conditions of employment for these men. Deep-pit latrines have been installed in new European quarters at Bombo. In Jinja, many premises are installed with water-borne sewage, but the older European houses still have bucket latrines. Plans are in hand for the gradual conversion of Government quarters in this township to water-borne sewage disposal.

181. Uncontrolled development outside major townships continues to cause concern. In the case of Kampala it is particularly unsatisfactory, and a careful study is being made of effective methods of sanitary control.

(5) RURAL SANITATION

182. An innovation after the war was the training of hygiene orderlies (Annual Report 1947, page 31). Soldiers discharged from the army, preferably with experience of sanitary duties, but who were unable on account of lack of education to prepare for the Certificate of the Royal Sanitary Institute, were given a year's training. The training is predominantly practical, only the simplest basic theory being taught. The aim is to turn out a man who is able to apply his knowledge to improve conditions in his own village and his own tribal area.

183. A hygiene orderly is posted to serve about one thousand persons and works under the supervision of an assistant health inspector. He is expected to know and be known by the local inhabitants and to advise and assist them in enterprises bearing on health matters—in particular, the design and construction of new houses, the construction and upkeep of latrines and the improvement of water supplies. It has been found that these workers need the constant advice and encouragement of senior supervisory staff if they are to exert any real influence upon health conditions within their areas. Given this backing, the hygiene orderly should be able to play an important part in raising rural standards of sanitation.

184. Other aspects of rural sanitation have been discussed under housing and water supplies.

H. Health of labour

185. During the year under review, there have been many important developments affecting the health of labour. These include the enactment of ordinances for the regulation of the relations of employees and employers, and for the compensation of workmen injured as a result of their employment. Consultations were held with representatives of other East African territories and Ruanda-Urundi. The Department continues to concern itself actively with the housing and sanitary conditions of labourers and with their medical care.

186. During the year, returns of sickness were submitted by thirteen of the major employers. Although incomplete, they provide useful information concerning the health of labourers. The returns cover an average daily labour strength of thirty thousand men. Of 243 deaths recorded, ninety-eight were ascribed to malaria and fifty-six to pneumonia. The major causes of morbidity were malaria (thirty-four thousand), respiratory disease (sixteen thousand including 513 with pneumonia,) ulcers (fourteen thousand) and diarrhoea and dysentery (four thousand).

187. Injuries, mostly of a minor type, accounted for nearly nine thousand illnesses, and it is possible that many tropical ulcers start in

this way. At one estate the injuries were analysed according to the nature of work undertaken. It was found that trolley boys sustained the highest rate of accidents, fifty-four per thousand per month, while labourers engaged in cultivation and processing sustained only fourteen accidents per thousand per month. The rate was negligible among trained artisans and mechanics in the workshops. It is probable that this class of morbidity could be reduced by appropriate training of newly-engaged labourers, and by prompt treatment of all minor injuries.

188. Confirmatory evidence of the occurrence of silicosis with tuberculosis among workers in tin mines was received from the Silicosis Medical Bureau, Johannesburg, to whom radiographs and lung sections were sent. Evidence was forthcoming that silicotic lesions may develop in the lung after less than twelve months' exposure although the disease may not become clinically apparent for some years. It has already acquired a vernacular name in Kigezi—"Machina". Wet drilling has been in operation now for several years, although dry drilling was not legally prohibited until 1949, when the new Mining Ordinance and Regulations were introduced.

189. The nutrition of the worker is safeguarded by the dietary standards laid down in the Employment Rules. Canteens have been established by a few employers, and appear to be gaining in popularity.

190. The larger employers have qualified medical staff to supervise the health of their employees, and all injured workmen coming within the scope of the Workmen's Compensation Ordinance have to be examined by a qualified medical practitioner. The Ordinance provides for the payment of compensation and the cost of all medical expenses, including the cost of artificial limbs, for injured workmen in certain categories.

I. Port Health

191. *Airports.*—Of the ten aerodromes in Uganda, only Port Bell and Entebbe are in regular use by aircraft from outside territories. Approximately two thousand three hundred aircraft were disinfested with "freon" type aerosol bombs; searches after disinfestation revealed no surviving mosquitoes.

SECTION IV.—CURATIVE SERVICES

A. Hospitals

192. *Staff.*—Of the nineteen district hospitals, seven were without a European Medical Officer at the end of the year, compared with five at the end of 1948. One other was in charge of a Provincial Medical Officer, who was also responsible for a training school for nursing orderlies. Two rural hospitals were temporarily in charge of medical assistants on account of the general shortage of qualified medical staff.

193. *Buildings.*—Construction of a new hospital was begun at Moroto, replacing a mud and wattle building. At Arua, a double

ward block was completed and work was started on the replacement of the operating theatre. The foundations of a new maternity ward were laid at Lira and extensions to the Mental Hospital at Mulago were completed.

194. Temporary buildings erected at the end of the war are still in use, and some of them were re-roofed during the year at a total cost of £6,500. These included the training centres at Lira, Mbale and Masaka and a ward at Mulago. Extensions to staff quarters at Mulago, Kabale, Mbarara and Entebbe cost £13,000. Minor additions included a barbed wire fence for Tororo Hospital, a mortuary at Soroti, hot water installations at the European and Asian Hospital, Kampala, and improvements to stores at Mbale, Mulago, Masindi and Entebbe.

195. The total expenditure by Government on new medical buildings was £30,416. Of this, £2,843 was spent in the Eastern Province, £3,266 in the Western Province, £10,655 in the Northern Province and £13,652 in Buganda. Maintenance and minor repairs to permanent buildings cost an additional £4,176.

196. *Mulago Hospital*.—Mulago Hospital deserves special mention on account of its size and function as a teaching hospital. With 637 beds, it is the clinical training centre for Makerere College Medical School and the Government school for African female nurses. The professional staff comprised the Medical Superintendent, eight Specialists, three Medical Officers and fifteen Assistant Medical Officers. Of these latter, some are trained assistants to the specialists while others have general duties. The nursing staff comprised the Matron, Assistant Matron, Sister-Tutor, fourteen Nursing Sisters and a trained African nursing staff. The ancillary staff included two European Pharmacists, eleven African Dispensers, an Optometrist, a Physiotherapist and a Staff Welfare Officer who also undertook occupational therapy in the wards. The Government specialist staff carried out part-time teaching for Makerere College Medical School.

197. Among the interesting activities of the hospital are the clinical meetings held every Saturday morning at which outside practitioners attend. During the year two Assistant Medical Officers started post-graduate studies in England. The facilities of the hospital have been made available to research workers. Dr. Margaret Thompson began studies on gastro-intestinal function in malnourished children on behalf of the Medical Research Council, while physiological investigations were conducted by Professor E. Holmes and Dr. H. Lehmann under a Colonial Research Scheme.

198. The number of surgical operations performed, including gynaecological and obstetric operations, amounted to 5,314 as against 4,567 in 1948. In addition, 560 ophthalmological operations were performed.

TABLE 38

Hospital and Dispensary Returns

					Hospitals	Dispensaries and Aid-Posts	Total
New patients—							
1948	...	...	...	...	841,005	1,418,106	2,259,111
1949	...	...	...	...	829,821	1,452,046	2,281,867
Re-attendances—							
1948	...	...	...	...	1,023,704	1,881,804	2,905,508
1949	...	...	...	...	895,840	1,746,330	2,642,170
TOTAL—							
1948	...	...	...	...	1,864,709	3,299,910	5,164,619
1949	...	...	...	...	1,725,661	3,198,376	4,924,037

NOTE.—New patients include out-patients and in-patients.

TABLE 39

Number of patients—by race—treated at district and rural hospitals

Year		EUROPEANS		ASIANS		AFRICAN	
		New Patients	Admissions	New Patients	Admissions	New Patients	Admissions
1948	...	4,831	1,312	12,016	2,463	824,158	86,426
1949	...	7,413*	1,308	11,840	2,260	810,568	85,990

NOTE.—* See note under Table 3.

TABLE 40

Data concerning in-patients—all races

		In-patients	Average days stay in hospital	Deaths	Surgical Operations
1948	...	90,201	11.5	3,023	10,184
1949	...	89,558	10.0	2,747	14,651

Table 40 gives data concerning in-patients of all races for the past two years. The average stay in hospital is based on those hospitals which record the total number of in-patient days.

TABLE 4I

	Buganda Province	Eastern Province	Western Province	Northern Province	Protectorate Total
Number of Medical Units					
European Hospitals ...	2	2	...	...	4
Asian Hospitals ...	3	4	2	1	10
African Hospitals—					
District ...	4	4	5	6	19
Rural ...	2	6	...	...	8
Dispensaries—					
With beds ...	18	17	25	10	70
Without beds ...	17	7	13	35	72
Aid-Posts ...	41	11	35	9	96
In-Patients					
Beds available—					
Europeans ...	66	5	1	...	72
Asians ...	51	35	7	3	96
Africans—					
District hospitals ...	1,101	699	341	351	2,492
Rural hospitals ...	91	251	...	...	342
Dispensaries ...	202	385	318	88	993
TOTAL BEDS ...	1,511	1,375	667	442	3,995
(a) Hospital Admissions					
Europeans ...	1,234	58	6	...	1,298
Asians ...	1,527	617	111	5	2,260
Africans ...	32,516	31,654	11,590	10,240	86,000
TOTAL HOSPITAL ADMISSIONS ...	35,277	32,329	11,707	10,245	89,558
(b) Dispensary Admissions					
...	5,879	10,564	5,037	2,407	23,887
Out-patients					
A. NEW PATIENTS—					
(a) Hospitals—					
Europeans ...	*5,610	1,242	458	103	7,413
Asians ...	4,483	5,995	1,026	336	11,840
Africans ...	233,497	327,314	121,039	128,718	810,568
TOTAL ...	243,590	334,551	122,523	129,157	829,821
(b) Dispensaries and Aid-posts ...					
...	361,481	359,423	368,753	362,389	1,452,046
TOTAL NEW PATIENTS ...	605,071	693,974	491,276	491,546	2,281,867
B. REATTENDANCES ...	848,065	572,908	680,198	540,999	2,642,170
GRAND TOTAL OF ATTENDANCES ...	1,453,136	1,266,882	1,171,474	1,032,545	4,924,037

NOTE —Out-patients includes all patients admitted to hospital.

* See note in para. 18.

B. Dispensaries

199. A travelling dispensary was introduced by the Busoga Local African Government during the year under review, visiting five places weekly and treating on an average 270 patients each day. It had a staff of five and undertook injection and other treatments.

200. Many dispensaries extend their sphere of action by regular visits of the medical staff to aid-posts. One district has aid-posts in permanent materials, others have temporary buildings, while some

districts use a room in the chief's office. Diagnostic and therapeutic facilities are necessarily primitive under such conditions and the medical value of these posts set against the expenditure of time and stocks is doubtful.

201. African Local Governments built additional staff quarters at Kamuge and Budaka (Mbale) and Nariam (Teso). Temporary buildings were replaced at Magoro (Teso), Ibuge (Lango), Madi Opei and Awere (Acholi), Bongo and Maracha (West Nile), Kinoni and Rubale (Ankole) and Katete (Kigezi).

C. Diseases treated

202. See Appendix VII and Section II. (Vital Statistics).

D. Mental Hospital Services

203. The three wards whose construction was begun in 1948 were put into commission during 1949, but even with these additions accommodation has proved unequal to the demands made upon it. At the end of 1948, there was accommodation nominally for two hundred patients, whereas 295 were in residence; at the end of 1949, the bed-strength had been increased to 320 but 390 patients were accommodated. This situation is due partly to district prisons no longer being used for the reception of mental cases.

TABLE 42
Mulago Mental Hospital—Admissions and Deaths

				Criminal		Civil		Total
				Male	Female	Male	Female	
Admissions—								
1948 ...	...	...	...	7	4	116	32	159
1949 ...	...	...	...	8	4	152	54	218
Deaths—								
1948 ...	...	...	...	7	2	72	22	103
1949 ...	...	...	...	3	...	37	9	49

N.B.—Of these admissions, nineteen were re-admissions compared with sixteen in 1948.

204. Occupational therapy has been extended, particularly out-of-doors activities. One development has been the growing of cotton by the patients. The number of patients receiving convulsant therapy increased from 78 in 1948 to 230 in 1949.

205. The number of deaths decreased. The outstanding cause of death is syphilis which accounts for nearly one-third of all deaths (neuro-syphilis nine, general paralysis of the insane six).

E. Dental Services

206. *Staff.*—During the latter half of the year, a dental clinic at Jinja was opened, in addition to the existing clinics at the European Hospital, Kampala and at Mulago Hospital. All prosthetic work is done in Kampala. The Dental Surgeon in Kampala attended Entebbe regularly and visited districts in the Western Province, while the

Dental Surgeon at Jinja visited districts in the Eastern and Northern Provinces. All district headquarters except Moroto were visited during the year.

207. Arrangements are being made for all third-year medical assistants to have one month's dental training.

208. The Dental Surgeon, Mulago Hospital made a dental survey and gave treatment at schools around Fort Portal. Special attention was also directed to the condition of the teeth during school medical examinations in Kampala.

F. Ancillary Services

(1) RADIOLOGICAL

209. The staff employed in this Division was augmented by the arrival of a radiographer during the year.

210. In all, 7,155 examinations were undertaken compared with 3,608 in 1948.

(2) PHARMACEUTICAL

211. The delivery of stores from the United Kingdom improved appreciably during the year, and it was possible to meet indents more promptly. The rising price of stores has made it necessary to call for special economy in the use of drugs and equipment and to search for cheap alternatives for materials which have increased in cost. At one time locally-purchased baled cotton offered advantages over imported cotton wool; now, with changing economic conditions, locally produced cotton is more expensive than imported cellulose wadding. On the other hand, wooden furniture, which at one time could be produced more cheaply locally, can now be replaced at a lower price by imported steel furniture.

212. A summary of materials prepared during the past two years is given below (Table 43). It reflects both fluctuations in demand and the difficulties caused by irregular supply. Thus, the fall in the output of ointments in 1949 was due to vaseline being unobtainable for five months in the latter part of the year:

TABLE 43
Summary of Materials

				1948	1949
Sterile preparations; expressed as—					
(a) ampoules	...	...	...	442	169
(b) vials	...	...	...	3,319	3,128
(c) litres	...	...	...	3,752	3,944
Liniments	...	...	<i>pints</i>	4,763	3,384
Liquors	...	...	"	909	2,333
Mixtures, concentrated	...	...	"	913	790
Spirits	...	...	"	1,426	2,118
Sprays	...	...	"	7,162	7,926
Syrups	...	...	"	1,513	534
Tinctures	...	...	"	5,313	3,376
Ointments	...	...	<i>lbs.</i>	30,454	12,484
Infusions	...	...	<i>pints</i>	942	440

213. The expenditure on stores, drugs and equipment, which was £27,000 annually ten years ago stood at £129,000 in 1949.

(3) REHABILITATION

214. Arising out of experience with military personnel, attempts to provide similar facilities for disabled civilians have resulted in the evolution of a cheap bamboo peg-leg.

215. Mulago General and Mental Hospitals are the only institutions where systematic attempts at rehabilitation have been organized. The physiotherapist and the welfare worker have undertaken this work, aided by a medical assistant and an African welfare assistant. Besides exercises and remedial occupational therapy, instruction was given in employments which could profitably be carried out by the patients in their homes after discharge. The handicrafts taught included spinning, weaving, rug-making, knitting and making raffia baskets.

In the mental hospital, emphasis is placed on cultivation and other outdoor activities within the capabilities of the patients.

(4) AMBULANCES

216. Before the war, ambulances were provided only at the larger hospitals or in those districts sufficiently wealthy to purchase them from Native Administration funds. Since the war, it has been possible to provide each district hospital, except Karamoja, with at least one ambulance.

217. The Department maintained thirty-nine vehicles, of which twenty-one were ambulances. The average number out of commission was nine, so that districts were frequently without any working vehicle.

SECTION V.—LABORATORY SERVICES

A. Pathology and Bacteriology

218. The staff of this Division has been below strength through officers being absent on vacation and fellowship leave.

219. Liaison with district hospitals has been strengthened by bringing laboratory assistants to the central laboratory for a refresher course when they return from leave. Arrangements have been made for Kahn tests to be carried out in some district laboratories.

220. Anti-rhesus factor sera were received from the British Red Cross Society, and fifty groupings were carried out. A total of 656 prospective blood donors, mostly Africans, were grouped, and in all cases haemoglobin estimations and tests for sickling were performed as well. Yellow fever inoculations numbered 5,208 for the first seven months of the year, compared with 6,722 for the whole of 1948. This service was taken over during the year by the Municipal authorities, who performed 3,062 inoculations. The issues of vaccine lymph decreased from 1,027,585 doses in 1948 to 877,390 in 1949.

221. Outdoor runs and healthier conditions were provided for the laboratory animals. Two hundred guinea-pigs were presented by the Veterinary Laboratory, Kabete. With careful mating to produce pure strains the condition of the stock has improved.

222. *Autopsies at Mulago Hospital.*—The number of bodies examined fully amounted to 425. At the request of the police 187 other examinations were performed.

TABLE 44

					1948	1949
Bacteriological examinations	...	...			3,909	6,162
Biochemical examinations	...	...			1,671	3,247
Tests for venereal disease	...	...			38,647	34,895
Haematological examination (excluding						
blood smears)	...	...			8,836	5,082
Blood smears	...	...	...	...	19,735	22,677

B. Government Chemist

223. *Water samples.*—Forty-eight samples were received for analysis, eleven being from Tororo for control of the alum-treatment plant, others being from the waters of Lakes Victoria, Albert and George. Samples from bore-holes were found to be very soft and somewhat corrosive owing to the presence of free carbon dioxide.

224. *Food and drugs.*—Forty-six samples of milk were examined in 1949, of which twenty-two were adulterated by the addition of water. A sample of milk preserved by oxygen under pressure (Hofius process) was quite wholesome after several weeks storage. Other samples included ghee (4), meal (2) and sugar (1).

225. *Forensic chemical examinations.*—162 specimens were received arising from fifty-two police cases. Metallic poisons found included arsenic and bismuth. Vegetable drugs indentified included bhang. Thirty-seven specimens were received for chemical examination, including drugs for identification and analysis of preparations from the Medical Store. Fifty-three commercial and industrial samples were dealt with for other departments or the East Africa High Commission.

C. Entomology

226. The Medical Entomologist was on leave for six months and the work of the section was restricted to the routine follow-up of surveys.

227. The surveys carried out during the year included the following:—

(a) *Tsetse*: on the Kigezi shore of Lake Edward, prior to the opening up of a motor road to the fishing villages.

(b) *Mosquitoes*: in Kigezi, Mengo, and at Jinja.

(c) *Simulium*: in Kigezi and at Jinja, where experiments have been conducted with the co-operation of Mr. J. D. Gillett of the Virus Research Institute.

(d) *Rats and fleas*: in Mengo district. This work has arisen out of the suspected occurrence of flea-borne typhus and is being undertaken in conjunction with the Senior Pathologist and the Virus Research Institute. It has been noted that *Rattus rattus kijabius* and *frugivorus* have almost entirely replaced other house rats in the area sampled. The flea index is low, averaging less than five fleas to each rat, but a few rats may have as many as forty fleas.

SECTION VI.—TRAINING OF PERSONNEL

228. *Assistant Medical Officers*.—The clinical training of medical students from Makerere College is carried out in the wards of Mulago Hospital. Six students passed the final examination for the Diploma of Medicine (East Africa), four being from Uganda.

229. Post-graduate instruction is being fostered by the grant of overseas scholarships, and three Assistant Medical Officers were taking courses of instruction in the United Kingdom, studying public health, medicine and physiotherapy respectively. Suitable officers are trained as chief assistants to the specialists in the departments of medicine, surgery and gynaecology at Mulago, and others working in district hospitals are brought back to Mulago for refresher courses.

230. *Medical Assistants*.—1949 was the last year in which medical assistants were trained at Mulago. The training school has now been transferred to Masaka. Sixteen passed their final examination and four who did not pass the examination are continuing their instruction with the nurses.

231. *Dispensers*.—A three-year course of training is given under the guidance of the Pharmacist at Mulago. Twenty-one learners were in residence, seven of whom were in their final year.

232. *Laboratory Assistants*.—A three-year course for laboratory assistants is conducted in the central laboratory. Four learners passed the qualifying examination, and were admitted to the Local Civil Service.

233. *Nurses*.—A three-year course in general nursing for girls is carried out at Mulago Hospital. Fifty-six pupils were admitted of whom forty-four were permitted to continue their studies after a three months preliminary course. At the final nursing examinations, twenty-three candidates passed and four failed.

234. Candidates from the Mission Training Schools were also examined for the certificate of the Uganda Medical Department. Eight from Nsambya passed and one failed; from Mengo, fifteen passed and one failed.

235. *Midwives*.—No training of midwives is undertaken by Government, but the midwives trained at the two Mission Training Schools are examined for the Certificate of the Uganda Midwives Board. Twenty-nine qualified as midwives during the year. (See paragraphs 159 and 162).

236. *Assistant Health Inspectors*.—In 1949, the school was transferred from Mulago to Mbale. The course is of three years' duration and the syllabus is approved by the Royal Sanitary Institute. The standards for entrants has been raised to Secondary IV.

237. The Instructor of Hygiene is assisted by three trained assistant health inspectors, with technical instructors in carpentry and building. At the beginning of the year there were ten students. Two final year candidates obtained the Certificate of the Royal Sanitary Institute and one candidate from the previous year was also successful.

238. *Hygiene Orderlies*.—The training is undertaken at the Hygiene School, Mbale and extends over one year. The course of instruction emphasizes the practical aspects of hygiene. All entrants were ex-army orderlies. Of thirty entrants, only twenty-one were retained to complete the course; of these, nineteen passed the final examination.

239. *Nursing Orderlies*.—A course for nursing orderlies, extending over two years, is given at Lira. There were fifty-one entrants, but the majority had to be excluded as unsuitable to continue the course. Twelve learners sat for the final examination and eleven were successful.

SECTION VII.—HEALTH OF PRISONERS

240. The health of prisoners compared favourably with that of the previous year and the overall death rate fell from fourteen per thousand in 1948 to seven per thousand in 1949. The death-rate of prisoners in the Northern Province, which was unduly high in 1948 (fifty per thousand), fell to sixteen per thousand in 1949.

TABLE 45
Causes of death in prisoners

Tuberculosis	...	...	...	1
Neurosyphilis	...	...	...	1
Cerebral syphilis	...	...	...	1
General paralysis of the insane			...	1
Dysentery	...	...	...	1
Cerebral malaria	...	...	...	1
Blackwater fever	...	...	...	1
General debility in lunatic			...	1
Insanity	...	...	...	1
Meningitis	...	...	...	1
Epilepsy	...	...	...	2
Pneumonia	...	...	...	1
Cirrhosis of liver	...	...	...	2
Bullet wound while escaping	...	...	...	1
Suicide—strangulation	...	...	...	1

241. *Central Prison, Luzira*.—The health of prisoners continued good, and the death rate fell from twelve per thousand in 1948 to seven per thousand in 1949. An outbreak of measles started in June and thirty prisoners were infected by the end of the year. There were 338 cases of malaria, fourteen per cent of which were confirmed microscopically, only one-third were admitted to hospital and no deaths occurred. Eighty-seven prisoners were treated in hospital for pneumonia but no deaths occurred.

242. *Local African Government Prisons*.—Sanitary conditions in these prisons are less satisfactory than in the Protectorate institutions. Following the civil disturbances, overcrowding became extreme in some Buganda prisons. The diet was adversely criticised at some prisons in the Northern Province.

Appendix I

LEGISLATION AFFECTING THE MEDICAL AND HEALTH SERVICES

Mining Ordinance (No. 5)

Section 84 gives medical officers power to inquire into the health of persons employed in mining.

Legal Notice 281 prescribes precautions to be taken against accidents and with regard to poisonous materials, ventilation, lighting and first-aid equipment.

Workmen's Compensation Ordinance (No. 15)

The Ordinance provides for compensation for injury to employees in certain occupations who earn less than £500 annually; for medical examination and treatment at the expense of the employer to a total sum not exceeding £100; and for the provision of artificial limbs. Compensation may also be paid for scheduled occupational diseases occurring up to a period of two years after ceasing employment, including the cost of medical aid. The occupational diseases are defined as anthrax, poisoning by arsenic, lead or benzene, and injury by radio-active or carcinogenetic substances.

Legal Notice 244 prescribes detailed fees for medical and surgical treatment.

Legal Notice 245 defines the types of employment to which the Ordinance applies.

Trades Disputes (Arbitration and Settlement) Ordinance (No. 19)

The Ordinance gives the Governor power to refer to arbitration disputes in public health, hospital or sanitary services.

Customs Tariff (Amendment No. 2) Ordinance (No. 25)

The Ordinance allows the entry free of duty and surcharge of specified medical and sanitary equipment, drugs and dressings.

Uganda Employment (Amendment) Ordinance (No. 28)

The Ordinance amends the provisions relating to the health of employees and their families.

Legal Notice 240 includes changes in the procedure for approving plans submitted under the Employment Rules.

Medical Practitioners and Dentists Ordinance (No. 36)

This Ordinance replaces the Medical Registration Ordinance of 1913, and provides for the licensing of sub-assistant surgeons and assistant medical officers who have left the Government medical service.

Mental Treatment Ordinance

Legal Notice 138 revokes the appointment made in 1947 of certain district prisons as mental hospitals.

Public Health Ordinance

Legal Notice 105 amends the definition of "cement mortar".

Legal Notice 237 amends the regulations governing slaughter-houses and butcheries.

Legal Notice 126 (Yellow Fever Control) relaxes restrictions on entry into Bwamba County, Toro.

Sleeping Sickness Ordinance

Legal Notice 43 extends the Lake Edward and Lake George Sleeping Sickness Area (to the south of the Ruwenzori Mountains) up to the 5,000 feet contour.

Legal Notice 155 redefines the South Busoga Restricted Area.

Townships Ordinance

Legal Notice 247 declares Bombo to be a Township.

Legal Notice 231 abolishes Bukakata Township.

Legal Notices 60 and 294 amend the boundaries of Port Bell and Fort Portal Townships.

Legal Notices 122, 170 and 238 restrict the keeping of animals or cattle in Entebbe, Kalisizo and Masaka Townships.

Legal Notice 222 appoints a cemetery in Fort Portal Township.

Waterworks Ordinance

Legal Notices 72 and 73 set up a Water Authority for Gulu Township.

Town and Country Planning Ordinance

Legal Notices 62 and 63 declare a planning area for Kampala and specified areas in the vicinity, and delegate the powers of the Board to the Kampala Municipal Council.

Appendix II

SCIENTIFIC PUBLICATIONS

BARNLEY, G. W. (1949) "Onchocerciasis in Kigezi District, Uganda." *East African Medical Journal*, Vol. 26, page 308.

BROWN J. G. (1949) "Lower Limb prosthesis for Africans." *East African Medical Journal*, Vol. 26, page 336.

BURKITT, D. P., LADKIN R. G., MCADAM, I. W. J. (1949) "Surgery of gonorrhoeal stricture of the male urethra". *East African Medical Journal*, Vol. 26, page 320.

CHERRY, J. K. T., RAPER, A. B. (1949) "A note on Icterus Gravis Neonatorum in Africans". *East African Medical Journal*, Vol. 26, page 215.

DAVIES, J. N. P. (1949) "The pathology of Central African Natives". *East African Medical Journal*, Vol. 26, page 76. (1949) "Sex hormone upset in Africans". *British Medical Journal*, Vol. 2, page 676.

DICK, G. W. A. (1949) "The relationship of Mengo encephalomyelitis encephalomyocarditis, Columbia S.K. and M.M. viruses". *Journal of Immunology*, Vol. 62, page 375.

RAPER, A. B. (1949) "Incidence of Sicklaemia". *Nature*, September 17th.

TROWELL, H. C. (1949) "Malignant Malnutrition (Kwashiorkor)". *Transactions Royal Society Tropical Medicine & Hygiene*, Vol. 42, page 417.

WILLIAMS, A. W., MACKAY, J. P. (1949) "Rapid deterioration of the sickle cell trait by the use of a reducing agent". *Journal of Clinical Pathology*, Vol. 2, page 141.

REVENUE AND EXPENDITURE

1948	Revenue	1949	
Actual		Estimated	Actual
£		£	£
11,566	Fees received—		
	Hospital receipts, European	8,000	5,528
	Hospital receipts, Asians		2,707
	Sale of drugs and collections		351
	Pathological fees		500
	Dental fees	700	498
1,413	Reimbursements from East African Railways and Harbours on account of medical services	2,800	3,331
8,910	Contributions from Buganda Government towards cost of stores and staff at dispensaries,	4,100	3,470
	Contributions from other African Local Governments		
£21,888	TOTAL REVENUE	15,600	16,385

1948	Expenditure	1949		
Actual		Estimated	Subvention to L.G.A.	Actual
£		£	£	£
315,611	Personal Emoluments—including training centres	347,291	4,843	347,025
145,645	Other Charges—Stores, drugs and equipment	119,250		129,120
50,345	Hospitals and laboratory maintenance—including training centres	48,820	2,283	44,740
16,557	Control of epidemic and endemic diseases	19,100	405	12,903
28,732	Transport of staff and patients	28,000	5,091	30,036
15,344	Other services—transport of stores, water, electricity, publications and incidentals	15,376	242	16,437
111	Public Health Propaganda	250		152
1,200	Telephone			
	CONTRIBUTIONS—			
	To Missions—			
7,175	For maintenance of midwifery centre	7,575		7,175
4,499	For relief of leprosy	5,650		5,483
500	For Kabarole hospital	500		500
645	Yellow Fever Research Institute			
55	Others	97		50
1,502	To External Institutions, etc.			
	SPECIAL EXPENDITURE—			
	Anti-yaws campaign	465		444
1,000	Building grants to leper settlements... ..	6,000		6,000
490	Water supply for Kumi Leper Colony			
	C.M.S. Maternity Training School			2,500
98	Equipment for hospitals and dispensaries	7,850		1,812
	Dental equipment	700		196
308	Others			
	Motor Vehicles			1,837
£589,819	TOTAL £	606,924	12,864	606,410

HONOURS

Dr. T. A. Austin, Director of Medical Services, to be a Companion of the Most Distinguished Order of St. Michael and St. George.

Mr. Kezironi Mukasa Kimaza Nsubuga, awarded the Certificate of Honour.

STAFF

Appointments and Promotions

Baird, Dr. R. B. ...	... Acting Senior Pathologist ...	2-10-49
Barrett, Dr. R. E. ...	... Acting Assistant Director of Medical Services ...	1- 1-49 to 10- 3-49
	... Acting Assistant Director of Medical Services ...	21- 4-49 to 5- 5-49
	... Assistant Director of Medical Services ...	5- 5-49
Black, Dr. J. J. ...	... Senior Medical Officer ...	1- 2-49
	... Acting Medical Superintendent, Mulago Hospital ...	1- 2-49 to 19- 5-49
Brooke-Smith, Miss A. ...	... Nursing Sister ...	29- 7-49
Burkitt, Dr. D. P. ...	... Acting Specialist Surgeon ...	28- 4-49 to 1- 8-49
Campbell Young, Dr. G. ...	... Specialist Alienist ...	3- 6-49
Cruickshank, Miss J. M. ...	... Matron, Grade II. ...	3- 1-48
Dowsett, Miss E. M. ...	... Nursing Sister ...	7- 9-49
Dunlop, Dr. R. Y. ...	... Senior Medical Officer of Health ...	14- 4-49
Hallsworth, Miss S. ...	... Nursing Sister ...	1- 2-49
Hennessey, Dr. R. S. F. ...	... Deputy Director of Medical Services ...	9- 2-49
	... Acting Director of Medical Services ...	21- 4-49
	... Director of Medical Services ...	5- 5-49
Hopwood, Miss A. M. ...	... Nursing Sister ...	12- 2-49
Hunter, Dr. J. K. ...	... Acting Senior Medical Officer (Labour) ...	21- 4-49 to 29- 5-49
	... Senior Medical Officer (Labour) ...	29- 8-49
Keep, Major R. W. ...	... Wardmaster ...	26- 7-49
King, Miss E. E. S. ...	... Matron, Grade II. ...	2- 7-48
Lowman Gould, Miss F. C. ...	... Nursing Sister ...	2- 4-49
MacKichan, Dr. I. W. ...	... Acting Senior Medical Officer ...	10- 8-49 to 25-10-49
	... Senior Medical Officer ...	25-10-49
McCarthy, Dr. D. D. ...	... Acting Deputy Director of Medical Services ...	1- 1-49 to 10- 3-49
	... Acting Deputy Director of Medical Services ...	21- 4-49 to 5- 5-49
	... Deputy Director of Medical Services ...	5- 5-49
Murphy, Miss J. S. ...	... Nursing Sister ...	12- 2-49
Murray, Miss J. R. ...	... Nursing Sister ...	22- 6-49
Musson, Mr. E. ...	... Pharmacist ...	17-11-49
Norman Jones, Dr. D. M. ...	... Medical Officer ...	9- 2-49
Postlethwaite, Mr. G. H. ...	... Acting Chief Health Inspector ...	12- 7-49
Rees, Mr. B. W. ...	... Wardmaster ...	1- 4-49
Salthouse, Mr. T. N. ...	... Laboratory Technician ...	23- 9-49
Scannell, Mr. J. J. P. ...	... Accountant ...	11- 1-49
Skaife, Miss E. M. ...	... Sister Tutor ...	2- 9-49
Snell, Dr. D. G. ...	... Acting Senior Medical Officer ...	22- 9-49
Stark, Miss J. M. ...	... Nursing Sister ...	28-10-49
Sutcliffe, Miss M. J. ...	... Nursing Sister ...	12- 2-49
Symonds, Miss M. R. ...	... Nursing Sister ...	29- 7-49
Taylor, Miss M. P. ...	... Nursing Sister ...	26- 7-49
Tucker, Dr. W. A. L. ...	... Acting Specialist Gynaecologist ...	14- 1-49 to 1- 8-49
	... Acting Specialist Surgeon ...	1- 8-49 to 6-11-49
Twohig, Dr. J. N. ...	... Medical Officer ...	23- 4-49
Twohig, Dr. N. C. Miller ...	... Temporary Medical Officer ...	9- 8-49 to 15- 2-50
Walpole, Miss R. ...	... Acting Matron, Grade I. ...	11- 4-40 to 1-12-49
Wild, Mr. C. H. J. ...	... Radiographer ...	9- 1-49
Wilks, Mr. G. W. ...	... Wardmaster ...	12- 4-49
Williams, Dr. A. W. ...	... Medical Superintendent, Mulago Hospital ...	17- 5-49
Wilson, Dr. W. A. ...	... Senior Medical Officer ...	5- 5-49
Winson, Miss G. M. ...	... Nursing Sister ...	13- 1-49

Appendix V—continued

Transfers, Retirements and Resignations

Austin, Dr. T. A. ...	Director of Medical Services, <i>retired</i> ...	16-10-50
Beaton, Mr. I. W. ...	Health Inspector, <i>transferred</i> ...	1- 1-49
Best, Dr. A. M. ...	Medical Officer, <i>resigned</i> ...	18- 9-49
Blackaby, Dr. E. J. ...	Senior Medical Officer, <i>retired</i> ...	17- 2-50
Brown, Dr. J. G. ...	Medical Officer, <i>resigned</i> ...	23-12-49
Coghlan, Dr. B. A. ...	Senior Medical Officer, <i>retired</i> ...	8- 4-50
Crisp, Dr. T. ...	Medical Officer, <i>resigned</i> ...	1- 8-49
Haines, Miss C. K. ...	Stenographer, <i>resigned</i> ...	9- 9-49
Harrison, Mr. A. ...	Pharmacist, <i>resigned</i> ...	15-11-49
Johnson, Mr. W. ...	Senior Health Inspector, <i>retired</i> ...	7-10-49
Lowman Gould, Miss F. C. ...	Nursing Sister, <i>resigned</i> ...	1- 9-49
Mackay, Mr. A. R. ...	Health Inspector, <i>resigned</i> ...	15-11-49
Mitchell, Dr. J. J. ...	Senior Medical Officer, <i>retired</i> ...	10-12-49
Ritchie, Mr. M. ...	Pharmacist, <i>transferred</i> ...	1- 8-49
Snow, Miss P. M. ...	Nursing Sister, <i>resigned</i> ...	6-10-49
Warn, Miss J. E. M. ...	Nursing Sister, <i>resigned</i> ...	12-12-49
Watt, Miss E. M. ...	Nursing Sister, <i>resigned</i> ...	15- 8-49

Appendix VI

SANCTIONED ESTABLISHMENT, 1949.

ADMINISTRATIVE DIVISION—

Director of Medical Services	...	1
Deputy Director of Medical Services	...	1
Assistant Director of Medical Services	...	1
Medical Superintendent, Mulago	...	1
Chief Matron	...	1
Chief Health Inspector	...	1
Accountants	...	2
Administrative Assistant	...	1
Stenographer-Secretaries	...	2
Chief Pharmacist	...	1
Chief Clerk L.C.S.	...	1
Asian Clerks	...	23

EXECUTIVE DIVISION—

Specialists	...	10
Senior Medical Officers	...	7
Medical Officers	...	41
Dental Surgeons	...	4
Hospital Superintendent	...	1
Assistant Hospital Superintendent	...	1
Wardmasters	...	5
Superintendent, Mental Hospital	...	1
Male Nurse	...	1
Female Nurses	...	2
Pharmacists	...	6
Instructor of Hygiene	...	1
Assistant Instructor of Hygiene	...	1
Senior Health Inspectors, and Health Inspectors	...	20
Sanitary Overseers	...	4
Radiographers	...	3
Dental Mechanic	...	2
Matrons	...	7
Nursing Sisters	...	49
Masseuses	...	2
Domestic Assistant	...	1
Welfare Worker	...	1
Asian Nurses and Probationers	...	11
Asian Medical Officers	...	2

Appendix VI—*continued*

EXECUTIVE DIVISION— <i>continued</i> .					
Senior Sub-Assistant Surgeon	...	...	...	...	1
Sub-Assistant Surgeons	...	...	...	...	8
Asian Assistant Storekeeper...	...	...	...	...	1
Relief Cook	...	...	...	...	1
Asian Cooks	...	...	...	...	2
Optometrist	...	...	...	...	1
LABORATORY DIVISION—					
Senior Pathologist	...	...	...	...	1
Pathologists	...	...	...	...	3
Government Chemist	...	...	...	...	1
Senior Entomologists and Entomologists	...	...	...	...	3
Laboratory Assistants	...	...	...	...	4
Assistant Bacteriologist	...	...	...	...	1
Physiological Laboratory Superintendent	...	...	...	...	1
YELLOW FEVER AND OTHER VIRUS RESEARCH—					
Pathologist	...	...	...	...	1
Laboratory Assistant	...	...	...	...	1
Stenographer-Secretary	...	...	...	...	1
Entomologist	...	...	...	...	1
Medical Research Worker	...	...	...	...	1
AFRICAN ESTABLISHMENT—					
Assistant Medical Officers	...	...	...	...	60
Laboratory Technician	...	...	...	...	1
Clerks	...	...	...	...	49
Medical Assistants	...	...	...	...	269
Assistant Health Inspectors	...	...	...	...	97
Laboratory Assistants	...	...	...	...	49
Dispensers	...	...	...	...	36
Entomological Orderlies	...	...	...	...	3
Artisans...	...	...	...	...	5
African Nurses and Midwives	...	...	...	...	361
Wardmaids	...	...	...	...	341

In addition to the above, there are varying numbers of African technical, clerical and menial subordinate staff employed in all units of the Department.

RETURN OF DISEASES AND DEATHS AT HOSPITALS, 1949.

Disease	Admitted			Total Deaths	Total Patients
	Males	Females	Total		
1. (a) Typhoid fever	276	193	469	77	470
(b) Paratyphoid	7	8	15	...	18
2. Typhus fever	56	24	80	...	81
3. Relapsing fever	248	98	346	11	413
4. Undulant fever	4	1	5	...	5
5. Smallpox	21	10	31	...	34
6. Measles	180	86	266	3	573
7. Scarlet fever ... ..	...	...	...	...	1
8. Whooping cough	178	241	419	15	1,102
9. Diphtheria ... ..	...	...	...	...	2
10. Influenza—					
(a) with respiratory complication	181	106	287	...	1,427
(b) without	206	89	295	1	9,823
11. Cholera ... ..	...	...	...	...	...
12. Dysentery—					
(a) Amoebic	515	218	733	13	2,247
(b) Bacillary	294	132	426	20	1,054
(c) Unclassified	144	65	209	8	1,797
13. Plague ... ..	...	...	...	...	...
14. Acute Poliomyelitis	8	1	9	...	12
15. Encephalitis lethargica	3	2	5	...	5
16. Cerebro-spinal fever	141	101	242	103	255
17. Rabies ... ..	...	...	...	...	...
18. Tetanus	38	21	59	17	61
19. Tuberculosis of the respiratory system	306	120	426	110	629
20. Other tuberculous disease	93	53	146	31	173
21. Leprosy	35	11	46	2	564
22. Venereal diseases—					
(a) syphilis	1,406	814	2,220	47	48,310
(b) gonorrhoea	4,728	2,451	7,179	63	31,839
(c) other venereal disease	808	479	1,287	4	8,549
23. Yellow fever ... ..	...	...	...	...	...
24. Malaria—					
(a) benign tertian	26	19	45	2	117
(b) subtertian	2,584	1,970	4,554	153	18,914
(c) quartan	85	87	172	3	1,353
(d) unclassified	2,907	2,162	5,069	79	87,520
25. Blackwater fever	26	13	39	8	45
26. Kala-azar ... ..	...	...	...	...	...
27. Trypanosomiasis	60	19	79	2	81
28. Yaws	559	406	965	2	28,191
29. Other protozoal diseases	39	30	69	2	2,708
30. Ankylostomiasis	1,519	961	2,480	28	8,508
31. Schistosomiasis	113	69	182	8	956
32. Other helminthic diseases	1,290	726	2,016	3	11,545
33. Other infectious and parasitic diseases	144	88	232	2	2,978
34. Cancer and other tumours—					
(a) malignant	61	59	120	11	133
(b) non-malignant	77	191	268	6	611
(c) undetermined	24	16	40	2	81
35. Rheumatic conditions	350	257	607	4	30,813
36. Diabetes	20	11	31	1	63
37. Scurvy ... ..	...	...	...	...	...
38. Beri-beri	1	1	2	1	2
39. Pellagra ... ..	...	1	1	1	4
40. Other diseases—					
(a) Nutritional	358	333	691	58	1,518
(b) Endocrine glands and general	156	118	274	8	463
41. Diseases of the blood and blood-forming organs	416	336	752	71	3,209

Appendix VII—continued

Disease	Admitted			Total Deaths	Total Patients
	Males	Females	Total		
42. Acute and chronic poisoning ...	85	73	158	5	181
43. Cerebral haemorrhage ...	9	1	10	6	15
44. Other diseases of the nervous system	348	175	523	49	6,667
45. Trachoma ...	232	157	389	1	4,945
46. Other diseases of the eye ...	872	659	1,531	4	25,339
47. Diseases of the ear and mastoid process ...	305	250	555	1	12,394
48. Diseases of the circulatory system—					
(a) heart disease ...	152	103	255	82	452
(b) other circulatory disease ...	69	49	118	8	371
49. Bronchitis ...	779	507	1,286	19	4,917
50. Pneumonia—					
(a) broncho-pneumonia ...	644	563	1,207	165	1,569
(b) lobar-pneumonia ...	1,612	707	2,319	169	2,644
(c) otherwise defined ...	577	260	837	51	1,323
51. Other diseases of the respiratory system ...	1,059	851	1,910	45	69,618
52. Diarrhoea and enteritis—					
(a) under 2 years of age ...	287	238	525	45	6,352
(b) over 2 years of age ...	339	272	611	21	9,708
53. Appendicitis ...	85	51	136	4	156
54. Hernia and intestinal obstruction...	1,545	319	1,864	165	5,644
55. Cirrhosis of the liver ...	90	34	124	36	150
56. Other diseases of the liver and biliary passages ...	157	85	242	25	513
57. Other diseases of the digestive system ...	1,374	840	2,214	86	58,425
58. Nephritis—					
(a) acute ...	58	35	93	21	130
(b) chronic ...	62	18	80	12	115
59. Other non-venereal diseases of the genito-urinary system ...	596	1,222	1,818	14	5,064
60. Diseases of pregnancy, childbirth and the puerperal state—					
(a) abortion ...		976	976	19	1,112
(b) ectopic gestation ...		18	18	4	18
(c) toxæmia ...		27	27	2	30
(d) other conditions ...		1,172	1,172	114	1,051
61. Diseases of the skin, cellular tissue, bones and organs of locomotion...	6,755	3,127	9,882	104	105,551
62. Congenital malformations and diseases of early infancy ...					
(a) congenital debility ...	36	29	65	14	42
(b) premature birth ...	82	108	190	86	201
(c) injury at birth ...	59	59	118	25	130
63. Senility ...	6	3	9	1	35
64. External causes—					
(a) suicide ...	4	1	5	...	8
(b) other forms of violence ...	5,435	1,928	7,363	252	70,293
65. Ill-defined causes ...	1,787	1,013	2,800	109	14,964
66. Malingering ...	27	17	44	...	257
67. Ante-natal supervision ...		1,853	1,853	...	34,906
68. Normal living babies ...	2,986	2,929	5,915	47	5,975
69. Post-natal supervision ...	2	483	485	1	9,785
70. Normal labour ...		5,698	5,698	21	5,838
71. Examination ...	137	108	245	1	54,176
	49,343	40,215	89,558	2,747	829,821

